I-Class™ *Mark II*

Maintenance Manual ▪ ▪ ▪

right by our customers. ▪ ▪ ▪

datamax·o'neil

Firmware (Software) Agreement:

The enclosed Firmware (Software) resident in the Printer is owned by Licensor or its suppliers and is licensed for use only on a single printer in the user's Trade or Business. **The User agrees not to, and not to authorize or permit any other person or party to duplicate, or copy the Firmware or the information contained in the non-volatile or programmable memory.** The firmware (Software) is protected by applicable copyright laws and Licensor retains all rights not expressly granted. In no event will Licensor or its suppliers be liable for any damages or loss, including direct, incidental, economic, special, or consequential damages, arising out of the use or inability to use the Firmware (Software).

WARNING

Lithium Battery: There is a danger of explosion or fire if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

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Adjustments and Maintenance

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1.0   Introduction

This manual, which primarily includes technical information relating to the electrical and mechanical components, is intended for use by qualified service personnel in the maintenance and repair of I-Class Mark II printers. For related information, refer to the following documents, available at http://www.datamax-oneil.com

- For operating information, reference the *Operator's Manual*.

- For software information, reference the *DPL Programmer's Manual*.

Important Information:

The exclamation point inside an equilateral triangle is intended to alert the technician to the presence of important operating, maintenance or servicing information. Always, as with all electrical equipment, follow basic safety precautions to avoid personal injury or printer damage.

1.1 About the Printer

The following drawing highlights the major components of the printer.

Cover Assembly

Leveling Cam

Printhead Latch

Printhead

Media Sensor

Platen

Ribbon Take-up Hub

Ribbon Supply Hub

Media Hub

Internal Rewind

Media Idler

Media Guide

Ribbon Idler

Printhead Assembly

Platen Block

Filler Block

Option Cards

Front Panel

Main PCB

Power Supply

Drive Gears

Drive Motor
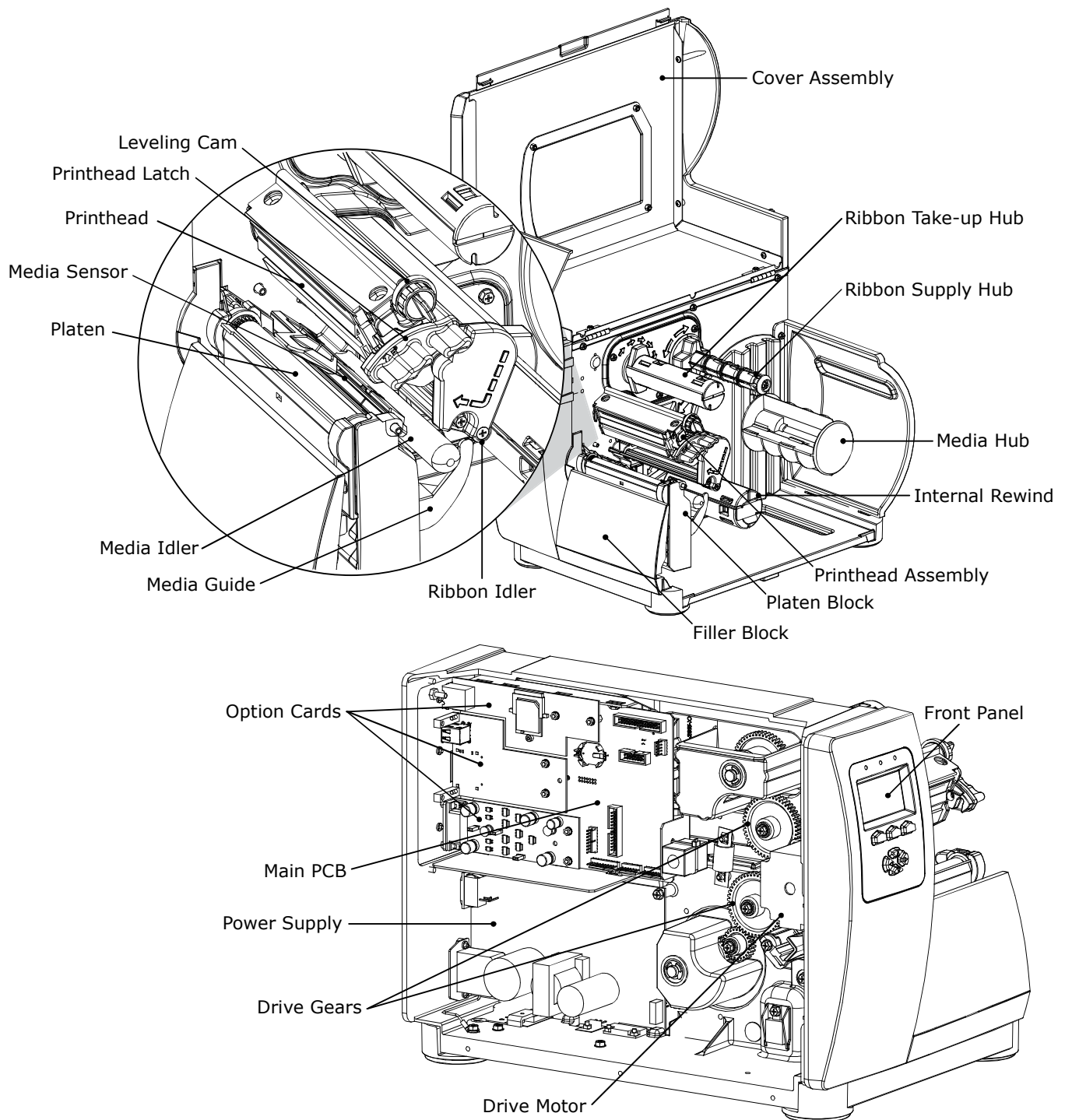
2.0 Introduction

This section covers the necessary maintenance and alignment procedures for the printer.

2.1 Media Sensor Calibration

This printer can use many different media compositions, configurations and colors. In addition to adjusting the Media Sensor and selecting the SENSOR TYPE, calibration is required. There are three different calibration methods.

2.1.1 Quick Calibration

Quick Calibration should be performed as part of the media loading routine to fine-tune the sensing parameters.

☑
  (1) This calibration is not necessary when using continuous stock.

  (2) Media containing large gaps may require a change in the PAPER EMPTY DISTANCE before proceeding.

Calibrate the printer as follows:

1. Ensure that the printer is ON and in an idle state (i.e., not off-line) with media loaded, the media sensor adjusted, and the sensor type selected.

2. Press and hold the FEED button until at least one full label has been output then release the button and wait for the printer to process the data. There are two possible outcomes:

    CALIBRATION COMPLETE - will be displayed, and the media will be advanced to the next top of form if calibration was successful; or,

    CALIBRATION FAILED will be displayed if calibration was not successful. In this case, check the hints listed below to help resolve the problem:

Calibration Hints:

    WARNING LOW BACKING is a normal message when calibrating die-cut media mounted on a highly translucent liner or notched tag stocks.

    If the initial attempt fails, press and hold the FEED button until two successive label TOFs have been output. If, however, CALIBRATION FAILED is displayed again, perform the Standard Calibration routine, see Section 2.1.3.

2.1.2 Empty Calibration

Empty Calibration calibrates the printer's media sensor to detect an 'Out of Stock' condition. Calibrate the printer as follows:

1. Ensure that the printer is ON and in an idle state (i.e., not off-line) with media removed.

2. Press and hold the Pause & Feed buttons together. The printer will now be calibrated for the 'Out of Stock' condition.

2.1.3   Standard Calibration

The Standard Calibration can be performed using the NETira CT Utility or using the front panel buttons via the printer's menu, (see the Operator's Manual). Standard Calibration provides dynamic readings, which can be helpful when using media with small position-critical notches or marks. Three calibration samples are required:

Empty – with nothing over the sensor;
Gap, Notch, Hole or Mark – with media liner, a notch, hole, or a mark over the sensor; and,
Paper – with the label (and liner, if any) over the sensor.

Calibrate the Media Sensor using the steps below:

☑   The Sensor Calibration menu item is only accessible in the Advanced Menu mode.

Step	Action	Displayed Message	Comment
A	Turn ON the printer.	READY	Wait briefly for initialization to complete.
B	Press the MENU button. Make sure MEDIA SETTINGS is highlighted and press ENTER. Then using the DOWN button, scroll to SENSOR CALIBRATION.	(Printer Menu)	
C	Press ENTER to access SENSOR CALIBRATION. Then using the DOWN button, scroll to PERFORM CALIBRATION. Press ENTER again and then press YES to proceed.	PERFORM CALIBRATION	Press NO to abort this procedure.
D	With no media installed, press ESC.	REMOVE LABEL STOCK PRESS ESC BUTTON yyy	This sets the empty value, where "yyy" represents the current sensor reading.
E	Proceed according to the media type: Die-Cut – Remove a label or two from the liner then install the media. Position the Media Sensor under the liner area and press ESC. Notched (or Reflective) – Install media. Position the Media Sensor under a notch (or black mark) and press ESC. Continuous – Press ESC then proceed to Step F.	*For die-cut media:* SCAN BACKING PRESS ESC BUTTON yyy *For Notched/Reflective media:* SCAN MARK PRESS ESC BUTTON yyy *For continuous media:* REMOVE LABEL STOCK PRESS ESC BUTTON Yyy	This sets the gap (or mark) value, where "yyy" represents the current sensor reading. ☑ *See the Operator's Manual for sensor adjustment instructions.* *Do not position a perforation over the sensor when taking the sample.* *(3) For small notches or reflective marks, ensure that the labels exit straight from the printer.* *(4) Unless otherwise noted, do not move the Media Sensor after this step.*

Standard Calibration (continued)

Step	Action	Displayed Message	Comment
F	Proceed according to the media type: All media except Continuous – Position label material (and liner, if any) over the sensor then press the ESC button. Continuous – Install media. Position the Media Sensor under the stock and press ESC.	SCAN PAPER PRESS ESC BUTTON YYY	This sets the paper value, where "yyy" represents the current sensor reading. *(1) If using preprinted media, ensure that the area placed over the sensor is free of text, graphics, or borders.* *(2) See the Operator's Manual for sensor adjustment instructions.*
G	Observe the calibration result.	*CALIBRATION COMPLETE*	Calibration was successful. ☑ *If WARNING LOW BACKING is displayed, calibration was successful.*
H	Press ESC then EXIT to return to READY. When calibrating gap or reflective media, press and hold the FEED button until at least one label is output.	*CALIBRATION COMPLETE* *Followed by...* *READY*	The printer is now ready for use.

2.1.4   Advanced Entry Calibration

Advanced Entry is an alternate calibration method for special-case media types, where sensor readings are taken using different sampling algorithms and from a list of these readings the best algorithm is selected for manual entry into the database.

✅ Advanced Entry Calibration should be used only when Standard Calibration proves unsuccessful.

Calibrate the Media Sensor using the steps below:

✅ The Sensor Calibration menu item is only accessible in the Advanced Menu mode.

Step	Action	Displayed Message	Comment
A	Turn ON the printer.	READY	Wait briefly for initialization to complete.
B	Press MENU button. Make sure MEDIA SETTINGS is highlighted and press ENTER. Then using the DOWN button, scroll to SENSOR CALIBRATION	(Printer Menu)	
C	Using the DOWN button, highlight ADVANCED ENTRY then press ENTER.	ADVANCED ENTRY	Press EXIT to abort this procedure.
D	Scroll to TRAN SENSOR GAIN (or REFL SENSOR GAIN, if using reflective media) then press ENTER.	TRAN SENSOR GAIN 25 (0 - 31)	The following examples detail die-cut media calibration; however, unless otherwise noted, the reflective media procedure is the same.
E	Install media. Position the Media in the Media Sensor then lower and latch the Printhead Assembly.	TRAN SENSOR GAIN 25 (0 - 31)	See the Operator's Manual for sensor adjustment instructions. ☑ *Do not position the Media Sensor under a perforation; and if using preprinted media, ensure the label area placed over the sensor is free of text, graphics, lines, etc.*

Advanced Entry Calibration (continued)

Step	Action	Displayed Message	Comment
F	Use the UP and DOWN Arrow buttons to set the Gain Number to 00. Record the sensor reading as a Label Value for Gain Number 00 in a table (32 rows by four columns, with headings similar to those shown below.)	TRAN SENSOR GAIN 00 (0 - 31)	This is the Label Value for a gain setting of 00.

Sample Calibration Table

Gain Number	Label Value	TOF Value	Difference Value
00	252		
01			
02			
…			
31			

Step	Action	Displayed Message	Comment
G	Use the UP and DOWN Arrow buttons to increment the Gain Number by one and then Record the Label Value. Repeat this process for each Gain Number.	TRAN SENSOR GAIN 01 (0 - 31)	This is the Label Value for a gain setting of 01.

Sample Calibration Table

Gain Number	Label Value	TOF Value	Difference Value
00	252		
01	250		
02	248		
…	…		
31	09		

Advanced Entry Calibration (continued)

Step	Action	Displayed Message	Comment
H	Raise the printhead assembly then proceed according to the media type: Die-cut – Remove a label or two from the liner then position the liner in the Media Sensor. Adjust the Media Sensor if necessary. Notched – Position the Media in the Media Sensor under the notch. Reflective – Position the Media in the Media Sensor under the black mark.	TRAN SENSOR GAIN 31 (0 - 31)	*(1) Do not position the Media Sensor under a perforation; and if using preprinted media, ensure the label area placed over the sensor is free of text, graphics, lines, etc.* *(2) Do not move the Media Sensor after this step.*
I	Lower and latch the Printhead Assembly. Using the UP and DOWN Arrow buttons set the Gain Number to 00. Record the reading as a TOF Value for Gain Number 00 in the table.	TRAN SENSOR GAIN yyy (0 - 31) 00	This is the TOF Value for a gain setting of 00, where "yyy" represents the current sensor reading.

Sample Calibration Table			
Gain Number	*Label Value*	*TOF Value*	*Difference Value*
00	252	248	
01	250		
02	248		
…	…		
31	09		

Advanced Entry Calibration (continued)

Step	Action	Displayed Message	Comment
J	Use the buttons to increment the Gain Number by one. Record the TOF Value. Repeat this process for each Gain Number.	TRAN SENSOR GAIN yyy (0 - 31) 01	These are TOF Values, where "yyy" represents the current sensor reading.

	Sample Calibration Table		
Gain Number	*Label Value*	*TOF Value*	*Difference Value*
00	252	248	
01	250	245	
02	248	234	
…	…	…	
31	09	14	

Step	Action	Displayed Message	Comment
K	In your sample calibration table, where both the Label Value and TOF Value are at least 20, subtract the amounts and record the result as a Difference Value (see below). Identify the largest Difference Value and the corresponding Gain Number. This Gain Number will be used to resample the media.	TRAN SENSOR GAIN yyy (0 - 31) 31	In this example, Gain Number 18 is chosen because, where both values are at least twenty, it has the highest Difference Value.

	Sample Calibration Table		
Gain Number	*Label Value*	*TOF Value*	*Difference Value*
00	252	248	4
01	250	245	5
02	248	234	14
…	…	…	…
15	188	63	125
16	184	51	133
17	179	38	141
18	174	25	149
19	170	19	N/A
…	…	…	…
31	132	14	N/A

Advanced Entry Calibration (continued)

Step	Action	Displayed Message	Comment
L	Use the buttons to set the Gain Number determined in the previous step. Press ENTER to enable the setting.	TRAN SENSOR GAIN yyy (0 - 31) 18	This example uses Gain Number 18.
M	Complete a table (see example below) using new measurements, as follows: (A) Raise the Printhead Assembly. Place the label over the Media Sensor then lower and latch the Printhead Assembly. Record the sensor reading as P. (B) Raise the Printhead Assembly. Place the liner, notch, or mark over the Media Sensor then lower and latch the Printhead Assembly. Record the sensor reading as G (or M). (C) Raise the Printhead Assembly. Remove all media from the Media Sensor then lower and latch the Printhead Assembly. Record the sensor reading as E.	TRAN SENSOR GAIN yyy (0 - 31) 18	Where "yyy" is a numerical value representing the current sensor reading. ☑ *The re-sampled values may differ from those previously noted. This is normal; do not readjust the Media Sensor.*

Selected Gain Table			
Gain Number	*Paper*	*Gap (or Mark)*	*Empty*
18	173	42	9

Advanced Entry Calibration (continued)

Step	Action	Displayed Message	Comment
N	Press the ESC button. Use the buttons to scroll to PAPER SENSOR LEVEL (or if using reflective media, REFL PAPER LEVEL) and then press ENTER. Use the buttons to set the Paper value determined in Step M and then press ENTER.	PAPER SENSOR LEVEL (0 - 255) 173	This is the Paper value.
O	Press the ESC button. Scroll to GAP SENSOR LEVEL (or, if using reflective media, MARK SENSOR LEVEL) and then press ENTER. Set the Gap (or Mark) value determined in Step M and then press ENTER.	GAP SENSOR LEVEL (0 - 255) 042	This is the Gap (or Mark) value.
P	Press the ESC button. Scroll to EMPTY SENSOR LEVEL and then press ENTER. Set the Empty value determined in Step M and then press ENTER.	EMPTY SENSOR LEVEL (0 - 255) 009	This is the Empty value.
Q	Press the EXIT button and, when prompted, press YES at the SAVE CHANGES prompt.	OFFLINE	The procedure is finished, the process almost complete.

Advanced Entry Calibration (continued)

| Step	Action	Displayed Message	Comment
R	Press and hold the FEED button until at least one label has been output.	CALIBRATION COMPLETE Followed by… READY	The printer is ready for use. ☑ If the calibration attempt fails, try desensitizing the sensor as follows: Re-enter the ADVANCED MENU. Go to MEDIA SETTINGS / SENSOR CALIBRATION / ADVANCED ENTRY / TRAN (or REFL) SENSOR GAIN and lower the corresponding GAIN SETTING by one. Exit the menu and save your changes. Test your media at the new setting. If necessary, repeat until a usable Gain Setting is obtained.

2.2 Printhead Adjustments

To ensure even and consistent print quality across a wide range of media types and sizes, the printhead is adjustable.

2.2.1 Leveling Cam Adjustment

The Leveling Cam ensures that even pressure is maintained across the label. Whenever using media that is less than the full width of the platen, proceed as follows:

1. Load the printer with media. Download a label format or choose a Quick Test Label and begin printing.

2. While observing the right side of the label, rotate the Leveling Cam clockwise, or counter-clockwise, until even print is achieved across the width of the label (see examples below).
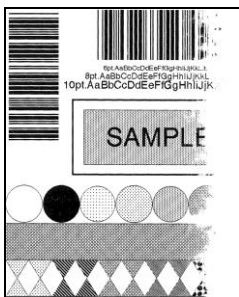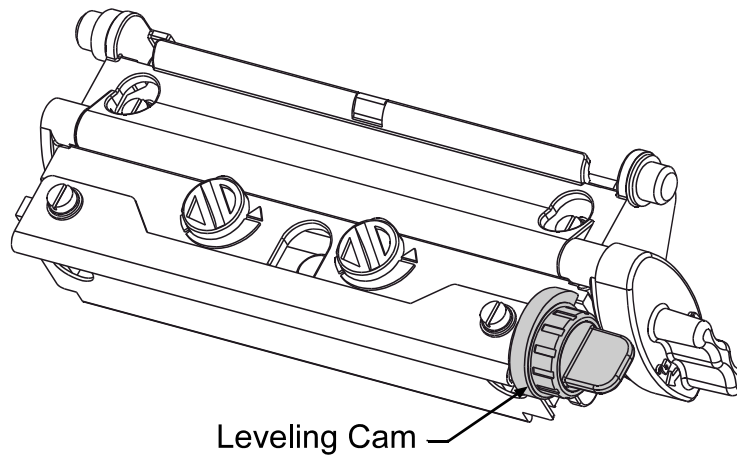
Leveling Cam

Example 1 –

Over-adjustment produces an image that fades across the label, requiring a decrease in the setting of the Leveling Cam.

→
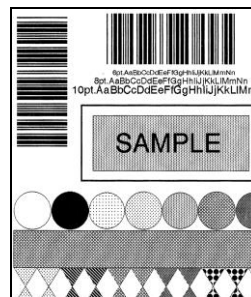
Example 2 –

Correct adjustment produces a complete image, with even print contrast across the label.

☑ **Note:** *Under-adjustment can cause ribbon wrinkling, tracking problems, and excessive wear on printer components.*

2.2.2   Pressure Adjustment

To maintain print quality across the variety of media types, the printhead pressure is adjustable. This adjustment should only be performed, however, after attempting improvement using the HEAT and/or PRINT SPEED settings. Use only the minimum pressure needed, following the steps below:

1. Load 4 inch (102mm) wide media (and ribbon, if needed). Then, disengage the Leveling Cam and latch the Printhead Assembly.

2. Enter the Quick Test Mode then select 100 Print Quality Labels and press the 🔍 **TEST** button to begin printing.

3. Turn each Pressure Adjustment Cam equally (counterclockwise to increase pressure or clockwise to decrease it) until even print quality is achieved across the label.
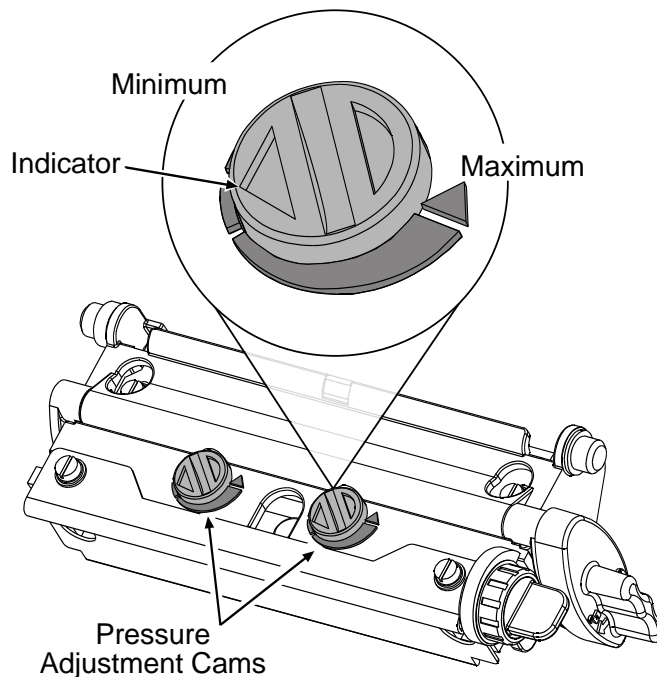

Note: *Excessive pressure can cause ribbon wrinkling, tracking problems, and excessive wear on printer components.*

2.2.3   Burn Line Adjustment

☑ **Note:**   *This adjustment is NOT REQUIRED during a normal printhead replacement.*

The Burn Line, a row of thermal elements that creates the image, is adjusted to compliance using 6.5-mil (.0065 inch) media to maintain print quality across a majority of types. In extreme cases, however, when media with a different thickness or rigidity is used (e.g., heavy tag stock) this relationship can change. If the print quality cannot be improved using HEAT and/or PRINT SPEED changes, then a Burn Line may be required as follows:

1. Load media (and ribbon, if needed). Disengage the Leveling Cam and latch the Printhead Assembly.

2. Loosen the two Locking Screws ½ to ¾ of a turn.

Locking Screws
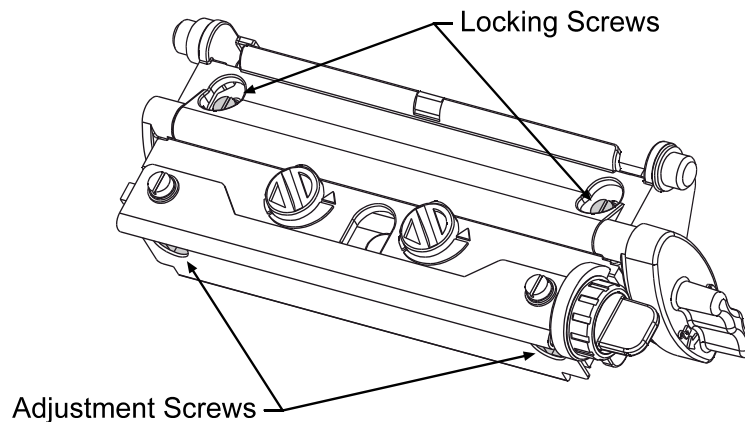
Adjustment Screws

3. Turn the Adjustment Screws counter-clockwise until the Burn Line is past the platen vertex. Print a Validation Label from the Quick Test Menu. The label should look light and uneven.

4. Tighten the Locking Screws just until they are "snug"– tight enough to remove any play in the printhead assembly, yet loose enough to allow the Adjustment Screws to move the printhead.

5. Turn <u>each</u> Adjustment Screws clockwise about ¼ a turn (or 1/8 a turn for finer adjustments). Print another Validation Label and examine the print quality. Repeat this step until labels with even print contrast (darkness) and acceptable print quality are produced.

   ☑ **Note:**   *Use care. When the Locking Screws are snug, turning the Adjustment Screws counter-clockwise will not move the printhead outward. If the printhead has been adjusted inward too far, the entire procedure must be restarted.*

6. Tighten the Locking Screws then print a final test label to verify the adjustment.

2.2.4   Printhead Voltage Adjustment

> ⚠️ **CAUTION**   Voltage measurement required; use extreme caution.

The printhead voltage adjustment is required (1) when replacing the power supply or (2) if the factory voltage setting of the power supply has been changed. No voltage adjustment is required during a routine printhead replacement. Adjust the Printhead Voltage as follows:

1. Turn OFF and unplug the printer and remove the cover; see Section 4.1.

RP1

J2
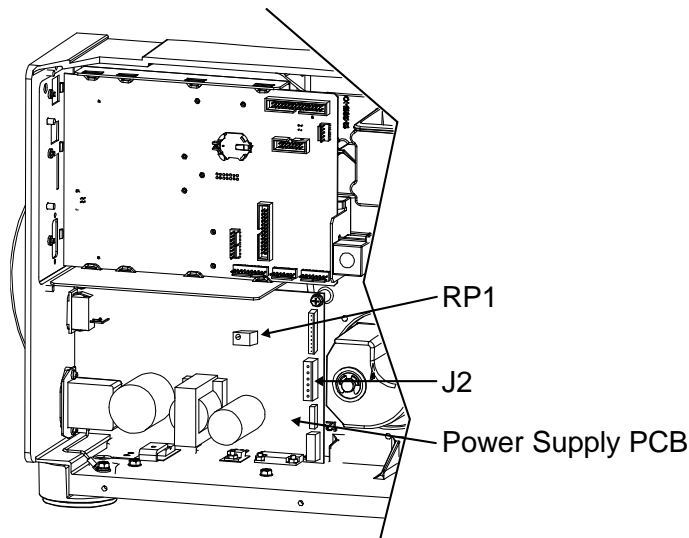
Power Supply PCB

2. Using a multi-meter set to measure DC voltage, connect the positive lead to Power Supply Connector J2 - pin 1 and the negative lead to J2 - pin 6.

3. Raise the Printhead Assembly. Locate and note the Printhead Resistance.

4. After ensuring that media is loaded, latch the Printhead Assembly in the down position. Plug in and turn ON the printer.

5. After READY is displayed, press the FEED button (this will enable the printhead voltage for approximately 30 seconds). Adjust the voltage using RP1 on the Power Supply PCB according to the printhead resistance listed in the appropriate table below.

6. Turn OFF and unplug the printer. Remove the multi-meter and replace the cover.

Printhead

Printhead Resistance
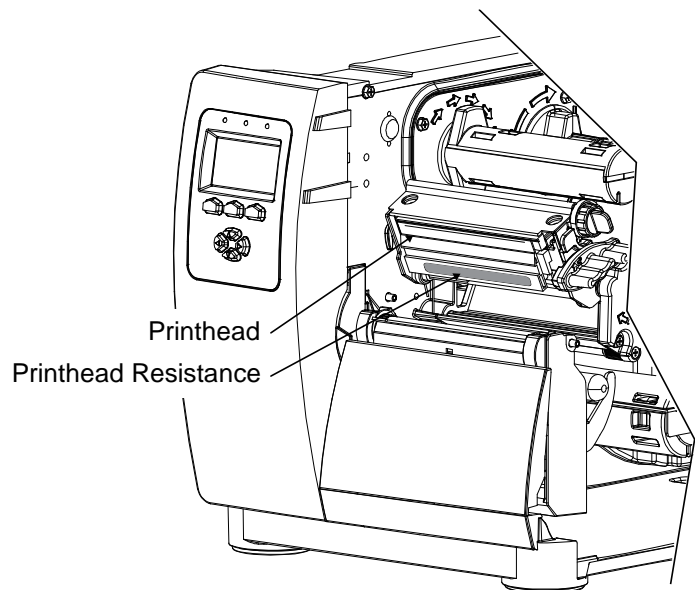
⚠️ **WARNING**	NEVER exceed the recommended Printhead Voltage; permanent damage or shortened service life can result.

Printhead Voltage Adjustment Table		
Printer Model	**Printhead Resistance** (ohms)	**Printhead Voltage** (+/- 0.1 Volt DC)
I4212e	572 - 597	22.4
	598 - 622	22.9
	623 - 647	23.3
	648 - 672	23.8
	673 - 697	24.2
	698 - 722	24.7
	723 - 747	25.1
	748 - 772	25.5
I4310e	947 – 989	22.4
	990 – 1030	22.9
	1031 – 1072	23.4
	1073 – 1114	23.8
	1115 – 1156	24.2
	1157 – 1197	24.7
	1198 – 1239	25.1
	1240 – 1281	25.5
I4606e	1530 – 1598	22.4
	1599 – 1665	22.9
	1666 – 1733	23.4
	1734 – 1800	23.8
	1801 – 1868	24.2
	1869 – 1935	24.7
	1936 – 2003	25.1
	2004 – 2070	25.5

2.3   Ribbon Path Alignment

If irregular voids extend intermittently, diagonally through an image printed with ribbon, the cause may be due to ribbon overlap (wrinkling). However, other factors can be involved. Begin troubleshooting by verifying correct adjustment of the Leveling Cam (Section 2.2.1), Printhead Pressure (Section 2.2.2), and Burn Line (Section 2.2.3). Also, examine the platen for wear, debris buildup, and excessive lateral movement. If all of these adjustments and components are in good order, then perform a Ribbon Path Alignment as follows:

1. Load 4 inch (102mm) or wider Media.

2. Load a matching Ribbon and allow it to feed with the Media from the printer.
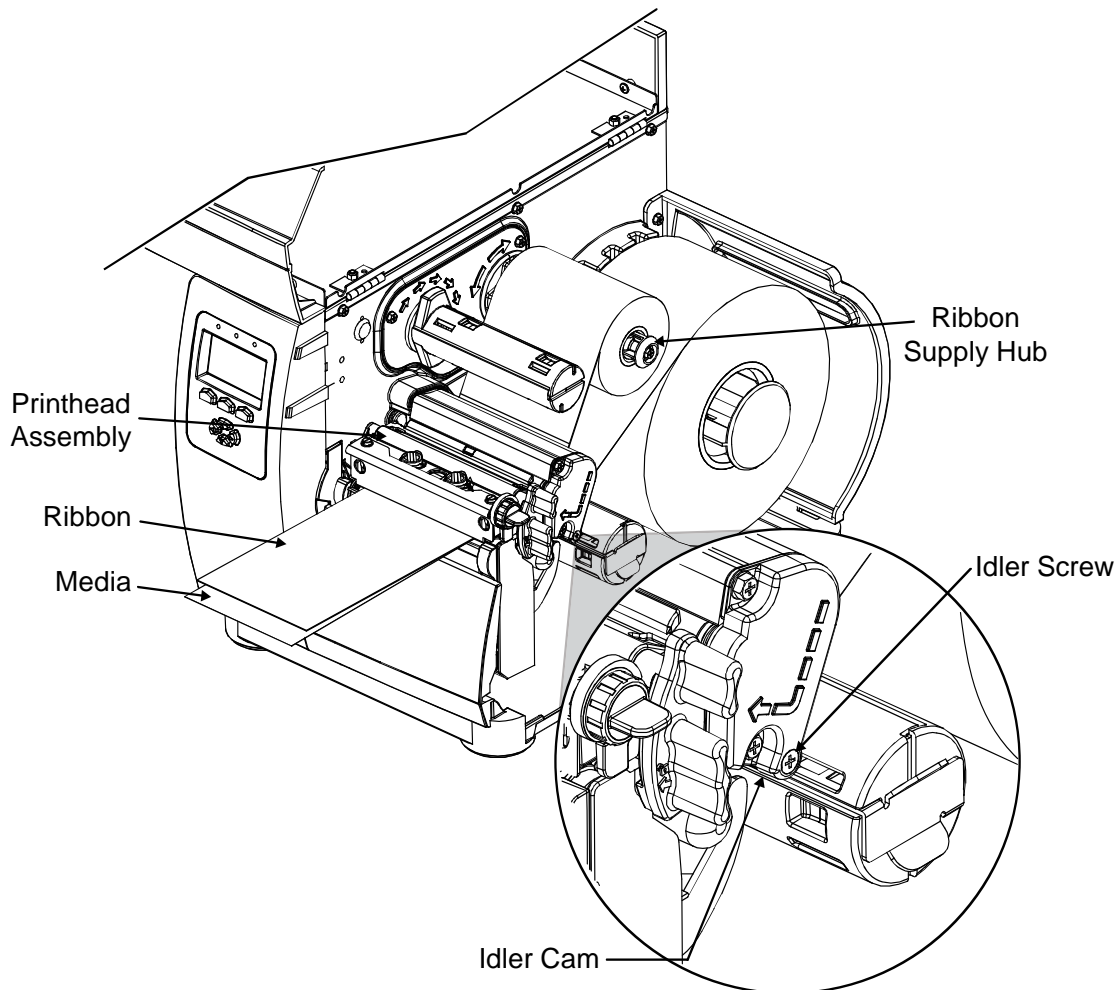
3. Disengage the Leveling Cam; see Section 2.2.1.

4. Plug in and turn ON the printer. Press FEED several times to normalize ribbon and label tracking. (If lateral movement is excessive, this must be corrected before proceeding-- typical causes include an unlatched printhead, uneven printhead pressure, a worn platen or worn platen bearings.)

5. Observe the ribbon for rippling and bagging as it travels from the Ribbon Supply Hub to the Printhead Assembly. If smooth, proceed to Step 6; otherwise, loosen the Idler Screw then, while repeatedly pressing FEED, rotate the Idler Cam until the ribbon is smoothly dispensed. Tighten the Idler Screw and feed several more labels to verify adjustment; repeat if necessary.

6. Attach the ribbon to the Take-Up Hub. Enter the Quick Test Mode and select 100 Quick Ribbon Test Labels then press TEST to begin printing.
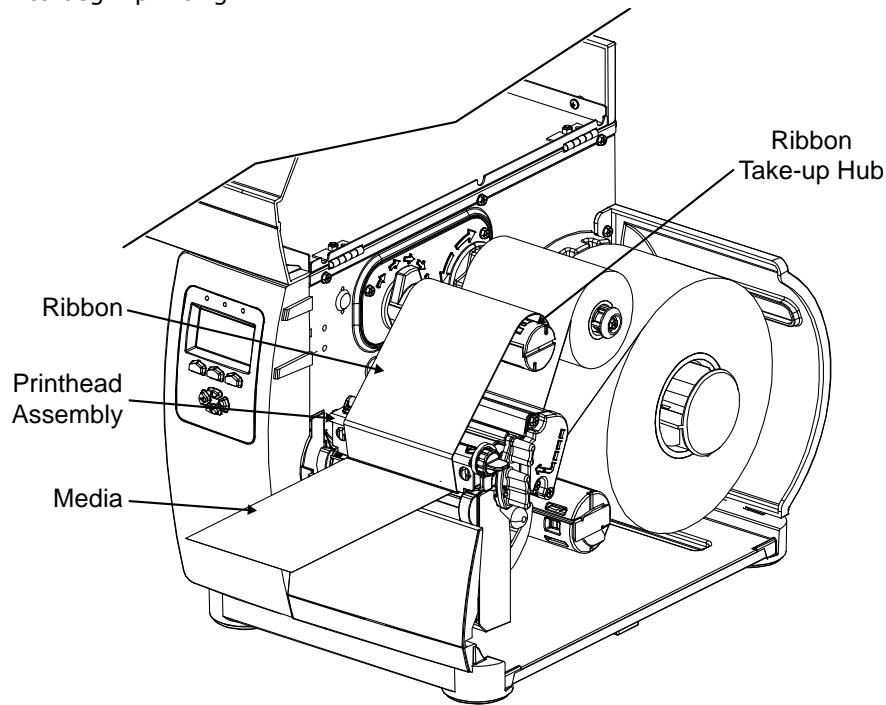
7. Observe the ribbon for rippling and bagging as it travels from the Printhead Assembly to the Take-Up Hub. If smooth and if printed labels show no evidence of ribbon wrinkling, proceed to Step 8; otherwise, slightly loosen the Ribbon Shield Adjustment Screws. Move the Ribbon Shield forward or backward to smooth the ribbon. Tighten the Ribbon Shield Adjustment Screws and print several more labels to verify adjustment; repeat if necessary.
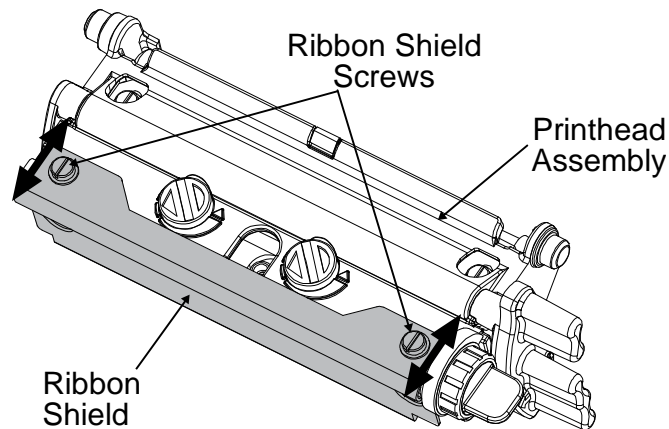
8. Press TEST to stop printing.

9. Install operating media and ribbon. Adjust the Printhead Leveling Cam, if needed. Send a label format from the host. Examine the printed labels and then, if needed, slightly readjust the Ribbon Shield.

2.4   Maintenance

This section details the items, techniques and schedules to help safely and effectively maintain the printer. The following cleaning items are recommended:

- Isopropyl alcohol
- Cotton swabs
- A clean, lint-free cloth
- Lens tissue
- Soapy water/mild detergent
- Compressed air or a soft-bristle brush
- Printhead Cleaning Cards and/or Printhead Cleaning Film

⚠ CAUTION	For your safety and to avoid damaging the printer, always turn OFF and unplug the printer before servicing. Always take proper precautions when using isopropyl alcohol, a flammable liquid.

Recommended Maintenance Schedule		
Component / Area	**Cleaning Interval ***	**Method / Supplies**
Printhead	Media type dependent: • Thermal transfer – after each roll of ribbon. • Direct thermal – after each roll of media, or as needed.	Isopropyl alcohol; and, if necessary, Printhead Cleaning Cards and / or Printhead Cleaning Film. See Section 2.4.1.
Platen	After each roll of labels, after each roll of ribbon, or as needed.	Cotton swab or cloth dampened with isopropyl alcohol. See Section 2.4.2.
Media Sensor, Media Path & Interior	As needed, based on a weekly visual inspection.	Compressed air or a soft brush. Isopropyl alcohol, as needed to remove all buildup. See Section 2.4.3.
Ribbon Path	As needed, based on a weekly visual inspection.	Isopropyl alcohol to remove all buildup. See Section 2.4.4.
Exterior Surfaces	As needed, based on a weekly visual inspection.	Mild detergent applied with a dampened cloth. See Section 2.4.5.

2.4.1   Cleaning the Printhead

<table>
<tr><td>⚠
CAUTION</td><td>NEVER use a sharp object on the Printhead; damage can result.</td></tr>
</table>

If print quality declines (symptoms can include non-compliant bar codes or streaks in the image), the typical cause is debris buildup on the printhead.

If not removed, debris buildup can result in permanent damage.

Depending upon the media and settings most typically used, different methods and materials are recommended for cleaning the printhead, as detailed below.
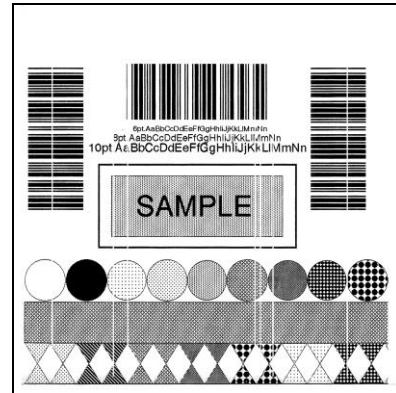
Faulty Label: Streaks (e.g., white lines) in the direction of print can indicate a dirty or faulty printhead.

2.4.1.1   Cotton Swab Procedure

This cleaning method is recommended when using direct thermal media or thermal transfer media with a wax ribbon.

1. Turn OFF and unplug the printer. **Wait for the printhead to cool.**

2. Raise the Printhead Assembly then remove the media (and ribbon, if installed). Using a Cotton Swab moistened (not soaked) with isopropyl alcohol, gently wipe the Printhead and Burn Line clean.
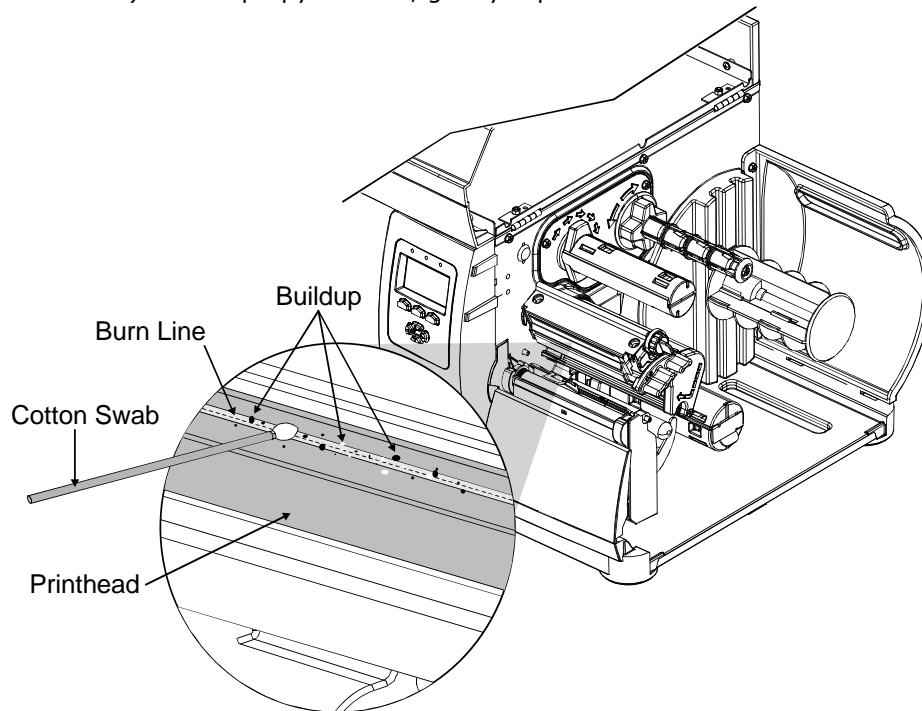
3. **Allow the printhead to dry.**

4. Install media (and ribbon, if necessary). Lower and latch the Printhead Assembly. Close the cover. Plug in and turn ON the printer. Run several sample labels and examine the print quality. If streaks are still present, go to Section 2.4.1.2; otherwise, this completes the procedure.

2.4.1.2   Cleaning Card Procedure

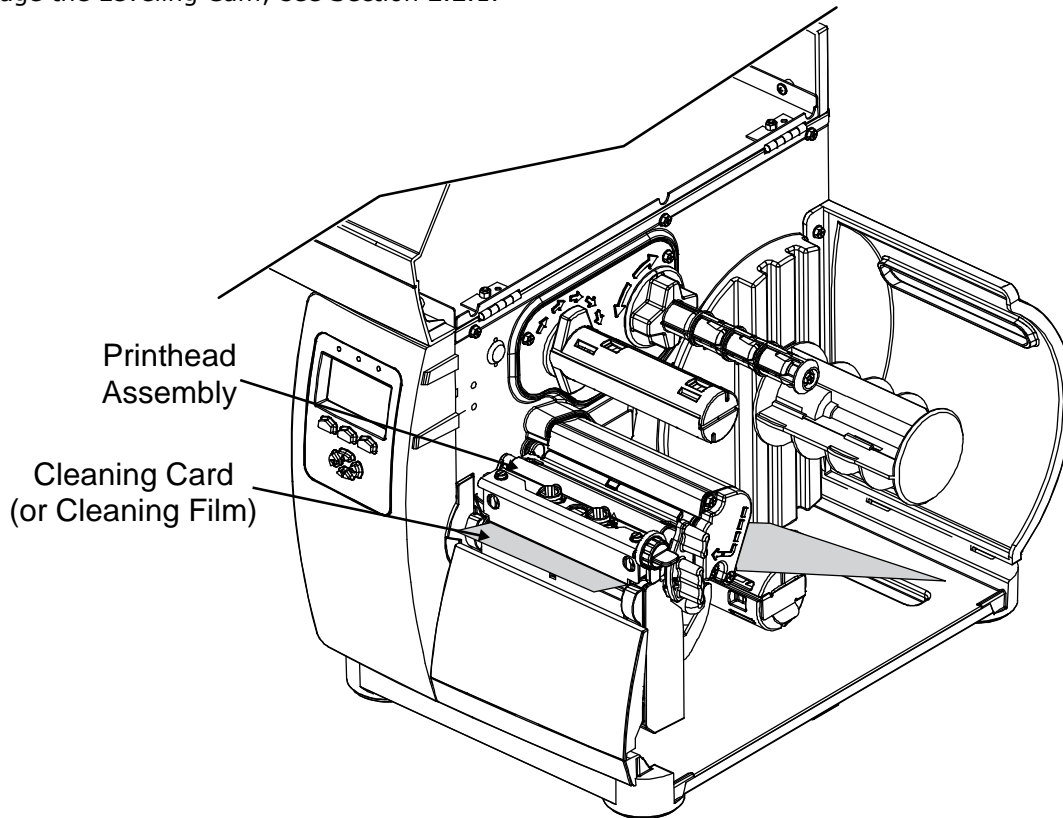This cleaning method is recommended when using direct thermal media, thermal transfer media with a wax ribbon, or if symptoms persist after performing the cotton swab procedure (see Section 2.4.1.1).

1. Turn OFF and unplug the printer. **Wait for the printhead to cool.**

2. Raise the Printhead Assembly then remove the media (and ribbon, if installed).

3. Place a Cleaning Card (part number 70-2013-01) under the printhead.

4. Lower and latch the Printhead Assembly.

5. Disengage the Leveling Cam; see Section 2.2.1.

Printhead Assembly

Cleaning Card (or Cleaning Film)

6. Close the cover. Press and hold the 🔍 **TEST** button for approximately four seconds. (As an alternate, CLEAN HEAD NOW can be selected in the menu.)

7. Install media (and ribbon, if necessary). Lower and latch the Printhead Assembly. Adjust the Leveling Cam. Close the cover. Run a few sample labels and examine them. If streaking is still present, go to Section 2.4.1.3; otherwise, this completes the procedure.

2.4.1.3   Cleaning Film Procedure

This cleaning method is recommended when using thermal transfer media with a resin ribbon, a HEAT setting of 22 or higher, or if symptoms persist after performing the other cleaning procedures.

1. Turn OFF and unplug the printer. **Wait for the printhead to cool.**

2. Raise the Printhead Assembly then remove the media (and ribbon, if installed).

3. Place a sheet of Cleaning Film (part number 70-2087-01) under the printhead (see illustration, Section 2.4.1.2).

4. Lower and latch the Printhead Assembly.

5. Disengage the Leveling Cam; see Section 2.2.1.

6. Close the cover. Press and hold the 🔍 **TEST** button for approximately four seconds. (As an alternate, CLEAN HEAD NOW can be selected in the menu.)

7. Turn OFF and unplug the printer. Clean the printhead; see Section 2.4.1.1.

8. Install media (and ribbon, if necessary). Lower and latch the Printhead Assembly. Adjust the Leveling Cam. Close the cover. Run a few sample labels and examine them. If streaking is still present, see Section 3.2.4.

2.4.2   Cleaning the Platen

> ⚠️ **CAUTION**   NEVER use a sharp object on the Platen.

A Platen contaminated with grit, label adhesive or ink can cause a decline in print quality and, in extreme cases, cause labels to wrap the roller. Clean the Platen as follows:

1. Turn OFF and unplug the printer.

2. Open the cover. Raise the Printhead Assembly and remove the media.

3. Using a Cotton Swab (or lint-free cloth) dampened with isopropyl alcohol wipe the Platen, manually rotating the roller until the entire surface is clean. **Allow the Platen to dry.**

Cotton Swab

Platen Roller
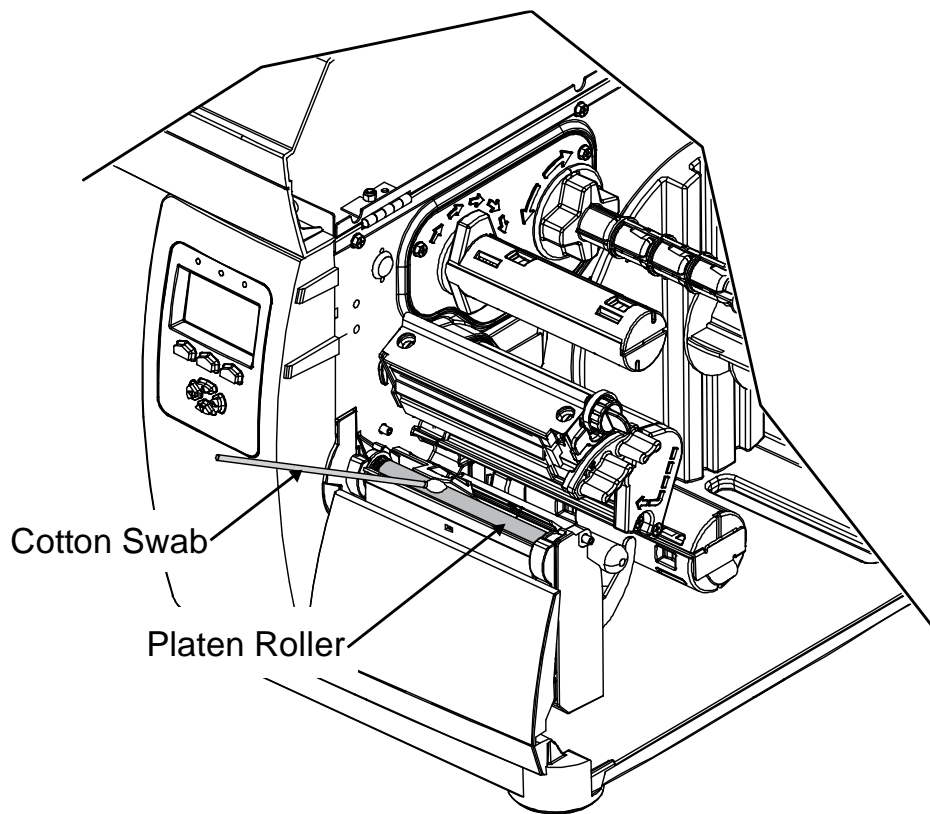
4. Install media then lower and latch the Printhead Assembly.

5. Close the cover. Plug in and turn ON the printer. Feed several labels to normalize tracking.

2.4.3   Cleaning the Media Path, Media Sensor, and Interior

As paper dust and other contaminants accumulate inside the printer, the particles can be pulled through the Media Sensor to the printhead, causing inconsistent label detection and voids in the print. To prevent problems, clean Media Path, Media Sensor and other components as follows:

1. Turn OFF and unplug the printer. Raise the cover.

2. Raise the Printhead Assembly then remove the media (and ribbon, if installed).

3. Using compressed air or a soft brush, remove all debris from the Baseplate and the Media Sensor.

4. Using a cotton swab dampened with isopropyl alcohol, wipe the Media Idler, Media Guide and, if attached, the Tear Bar or Rewind Arcplate clean.

5. Allow the components to dry then replace the media (and ribbon, if necessary). Lower and latch the Printhead Assembly.

6. Close the cover. Plug in and turn ON the printer. Feed several labels to normalize tracking.

2.4.4   Cleaning the Ribbon Path

If equipped with the Thermal Transfer option, as ink accumulates on the Ribbon Path components, smooth ribbon flow can be impeded causing wrinkling. To prevent problems, clean the Ribbon Path components as follows:

1.   Turn OFF and unplug the printer. Raise the cover.

2.   Raise the Printhead Assembly then remove ribbon.

Ribbon Shield
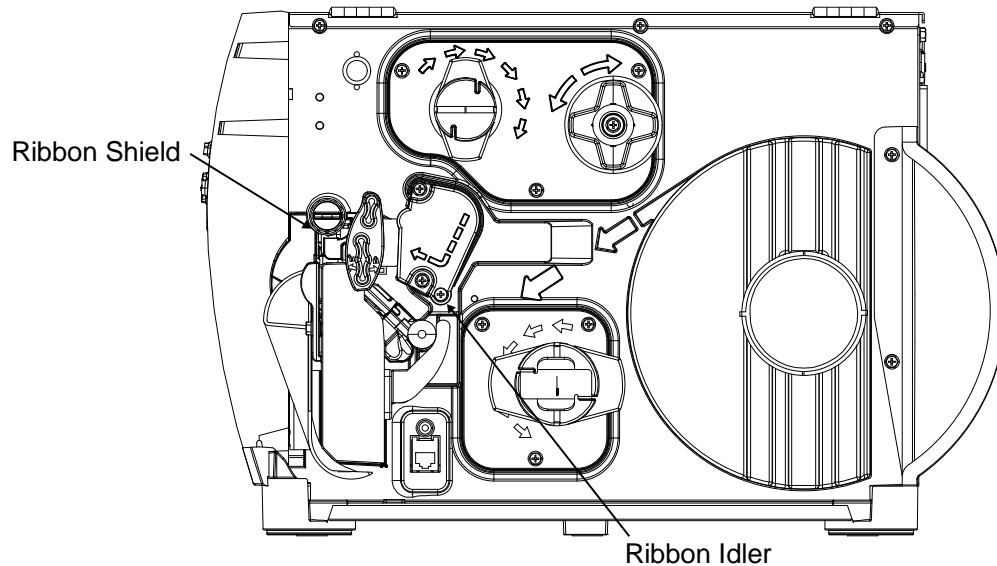
Ribbon Idler

3.   Using a cotton swab dampened with isopropyl alcohol, wipe the Ribbon Idler and the Ribbon Shield clean.

4.   Allow the components to dry then replace the ribbon. Lower and latch the Printhead Assembly.
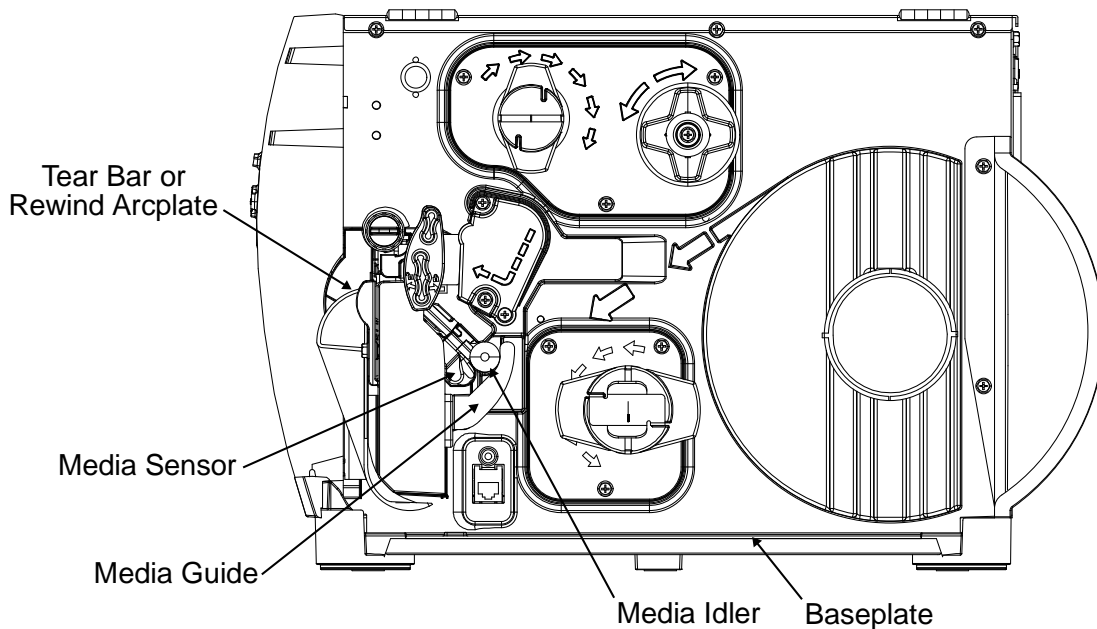
5.   Close the cover. Plug in and turn ON the printer. Feed several labels to normalize tracking.

2.4.5   Cleaning the Exterior Surfaces

When soiled, clean the outer surfaces of the printer with a general-purpose cleanser. (Never use abrasive cleansers or solvents.)

1.   Turn OFF and unplug the printer.

2.   Using a soft cloth or sponge dampened with a general-purpose cleanser to wipe the exterior surfaces clean.

3.   Allow the surfaces to dry.

2.5   Firmware Updates

When program updates and/or new features are added, they can be downloaded to the printer as follows:

1. Identify the new version for your model of printer from the Datamax-O'Neil Web site at www.datamax-oneil.com and download it onto your computer's hard drive.

2. Launch the NETira CT configuration utility, and query (connect) to the printer, (see the Operator's Manual for more information on NETira CT).

> (i)   It is recommended that the configuration be saved before downloading firmware, and restored when finished. Be sure to check the box labeled "Include Sensor Calibration Data on Open" when restoring the configuration.

3. Go to the Tools>Upgrade>Firmware. Select the binary file (BIN file).

4. Click the 'Send' button to start the firmware update.
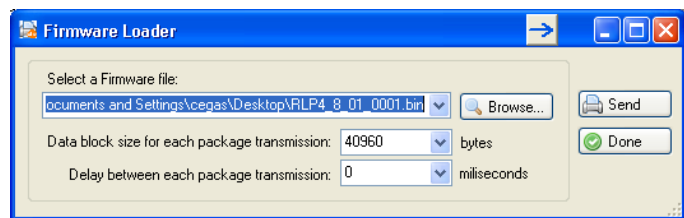
> (i)   Be sure only that only one communication cable is connected to the printer before attempting the firmware upgrade. Do not attempt to send any other data or perform operations via the front panel when the firmware is downloading.

2.5.1 Loading Boot 1 and Boot 2 and Firmware

1) Connect the printer to your PC using a serial cable.

2) Launch the NETira CT configuration utility, and query (connect) to the printer, (see the Operator's Manual for more information on NETira CT).

> (i) It is recommended that the configuration be saved before downloading firmware, and restored when finished. Be sure to check the box labeled "Include Sensor Calibration Data on Open" when restoring the configuration.

3) Go to the Tools>Upgrade>Firmware. Select the binary files (BIN files) for each of the Boot files.

4) Check the "Select and Download Boot 1 file:", "Select and Download Boot 2 file:" and "Erase System and/or User Area" boxes and click send to initiate the download.

> (i) Be sure only that only one communication cable is connected to the printer before attempting the firmware upgrade. Do not attempt to send any other data or perform operations via the front panel when the firmware is downloading.

> ☑ Always Check "Erase System and/or User Area" box unless otherwise instructed.
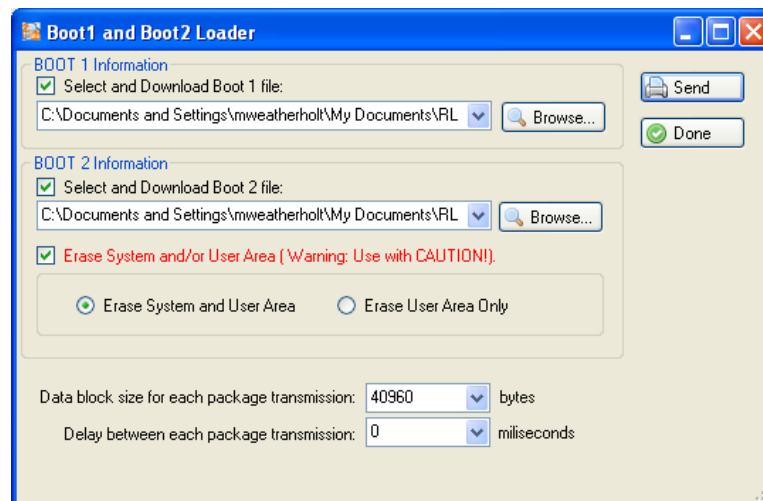
5) Once the Boot Loader files have been loaded, the firmware version can now be updated using the procedure outlined in section 2.5.

3.0   Introduction

This section covers techniques for isolating and correcting printer problems.

3.1   Troubleshooting

Use the following procedures to isolate and correct malfunctions. When problems are isolated to a Printed Circuit PCB (PCB), assembly replacement is suggested, as component level repair is not generally feasible in the field.

☑ **Note:**   *Unless otherwise noted, see the Operator's Manual for configuration, interfacing and setup information.*

3.1.1   Initial Steps

⚠ **CAUTION**   (1) Before servicing always unplug the printer; (2) ensure that the unit has been placed on a level, stable surface; and, (3) use extreme care if measuring voltages.

Perform the following actions before troubleshooting then proceed according to the symptom:

- Remove any dirt or dust accumulations (see Section 2.4);
- Confirm that the AC outlet voltage is within specification;
- Confirm that the environment is acceptable;
- Confirm correct media and loading; and,
- If installed, disable the Present Sensor.

3.2   General Problem Resolution

When troubleshooting, if the problem is not accompanied by an error message, begin with Problem Isolation (Section 3.2.1). Follow the flowchart steps then take the appropriate action to find the defective item (listed by probability) or, when necessary, further instructions.

3.2.1   Problem Isolation

1. Ensure that AC line voltage is within the operating range for the printer, and that the unit is installed in an acceptable environment. Turn ON the Power Switch. Did the printer power up?	—(Yes)→ Go to Step 2.

↓ (No)

Go to Section 3.2.2

2. Load media (and ribbon if necessary). Press TEST. Scroll to PRINT QUALITY LABEL then press TEST. Was a Print Quality Label produced?	—(Yes)→ Go to Step 4.

↓ (No)

3. Was a fault message generated?	—(Yes)→ Go to Section 3.3.2.

↓ (No)

Go to Section 3.2.3

4. Examine the label. Is the print quality satisfactory?	—(Yes)→ Go to Step 5.

↓ (No)

Go to Section 3.2.4

5. With the printer at 'Ready' and connected to a host computer, send a label format with a batch count of at least ten to the printer. Did the format print?	—(Yes)→ Go to Step 6.

↓ (No)

Go to Section 3.2.5

6. Examine the printed batch. Were any labels skipped during the batch?	—(Yes)→ • Calibration may be needed (see Section 2.1); or, • Media sensor adjustment may be needed.

↓ (No)

Tests complete.

3.2.2   No Power

☑ ***Note:***   *(1) Ensure the AC outlet is functioning properly, with the power cord securely connected to the outlet and printer; and, (2) some printer circuits are protected by resettable fuses, when tripped cycling power will reset those fuses.*

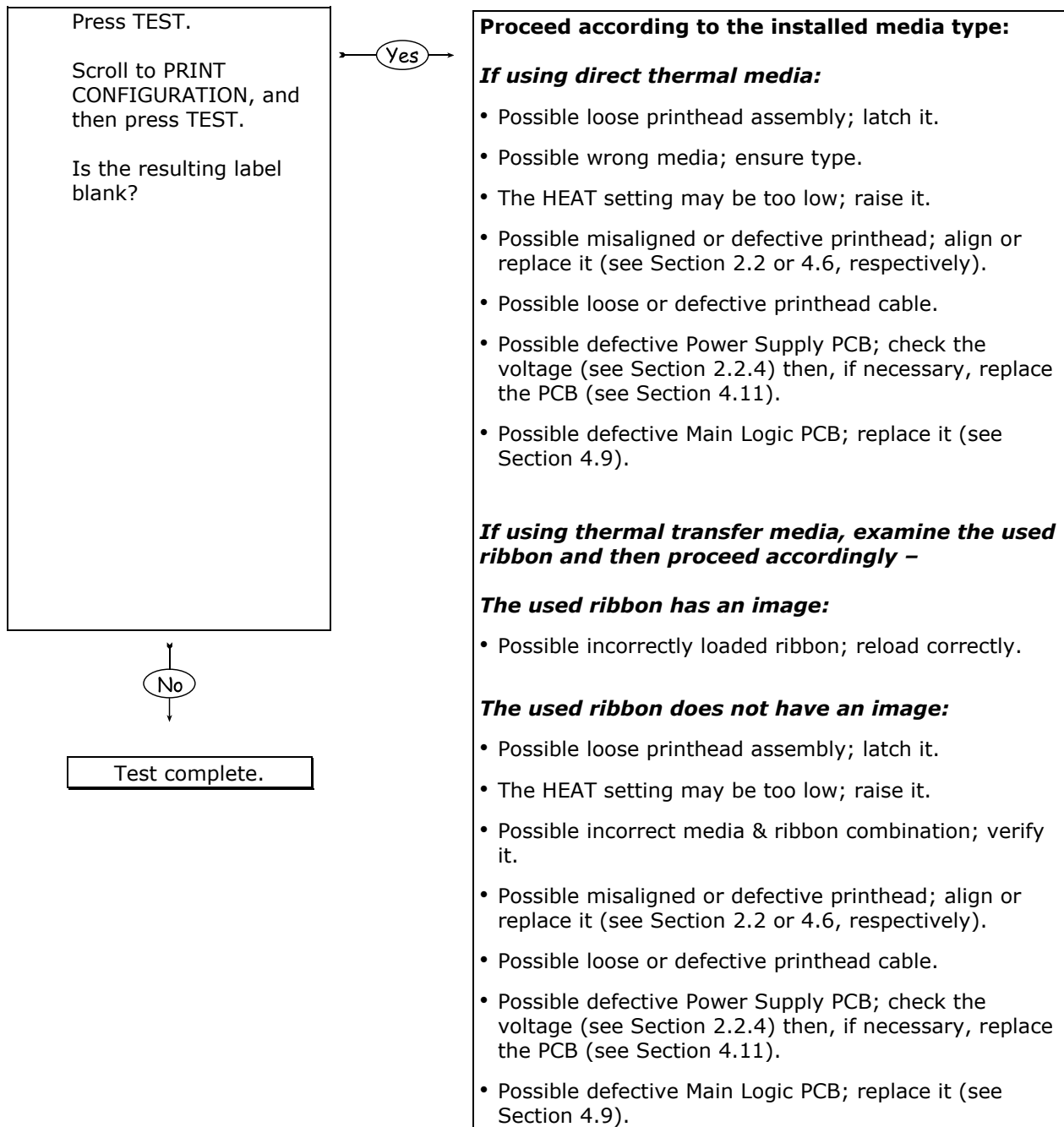| 1. Turn OFF the printer. Wait 30 seconds then turn the printer ON. Did the printer power up? | ➤ (Yes) ➤ | If the display remains dark, press and hold the Menu key to adjust contrast; otherwise, replace the Front Panel PCB; see Section 4.3. |

(No)

| 2. Turn OFF and unplug the printer. Check fuses F1 and F2 on the Power Supply PCB. Is a fuse blown? | ➤ (Yes) ➤ | Replace the fuse(s); see Section 4.10. If the fuse(s) continue(s) to fail, replace the Power Supply PCB; see Section 4.11. |

(No)

| 3. Disconnect the cables from J2 and J6 of the Power Supply PCB. Plug in and turn ON the printer. Does the printer power up? | ➤ (Yes) ➤ | Reconnect either cable. When power-up ceases, replace the associated component(s). |

(No)

| 4. Is the green LED located on the Power Supply PCB) ON? | ➤ (Yes) ➤ | Possible loose Front Panel cable; or, defective Front Panel PCB (see Section 4.3) or Main Logic PCB (see Section 4.9). |

(No)

| Defective AC Power Cord or Power Supply PCB. |

3.2.3   No Print

Press TEST.

Scroll to PRINT CONFIGURATION, and then press TEST.

Is the resulting label blank?

Yes →

No

Test complete.

Proceed according to the installed media type:

If using direct thermal media:

• Possible loose printhead assembly; latch it.

• Possible wrong media; ensure type.

• The HEAT setting may be too low; raise it.

• Possible misaligned or defective printhead; align or replace it (see Section 2.2 or 4.6, respectively).

• Possible loose or defective printhead cable.

• Possible defective Power Supply PCB; check the voltage (see Section 2.2.4) then, if necessary, replace the PCB (see Section 4.11).

• Possible defective Main Logic PCB; replace it (see Section 4.9).

If using thermal transfer media, examine the used ribbon and then proceed accordingly –

The used ribbon has an image:

• Possible incorrectly loaded ribbon; reload correctly.

The used ribbon does not have an image:

• Possible loose printhead assembly; latch it.

• The HEAT setting may be too low; raise it.

• Possible incorrect media & ribbon combination; verify it.

• Possible misaligned or defective printhead; align or replace it (see Section 2.2 or 4.6, respectively).

• Possible loose or defective printhead cable.

• Possible defective Power Supply PCB; check the voltage (see Section 2.2.4) then, if necessary, replace the PCB (see Section 4.11).

• Possible defective Main Logic PCB; replace it (see Section 4.9).
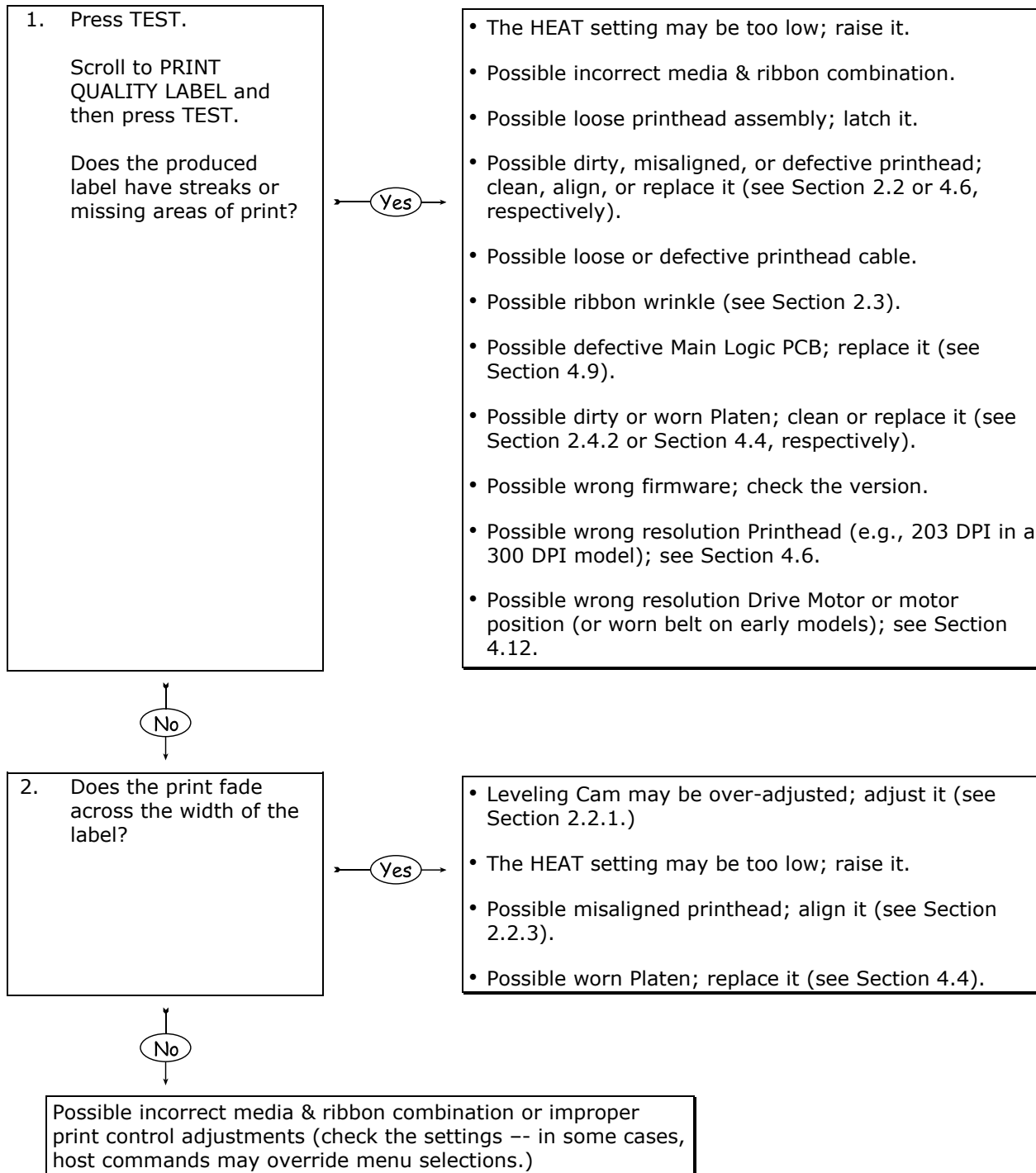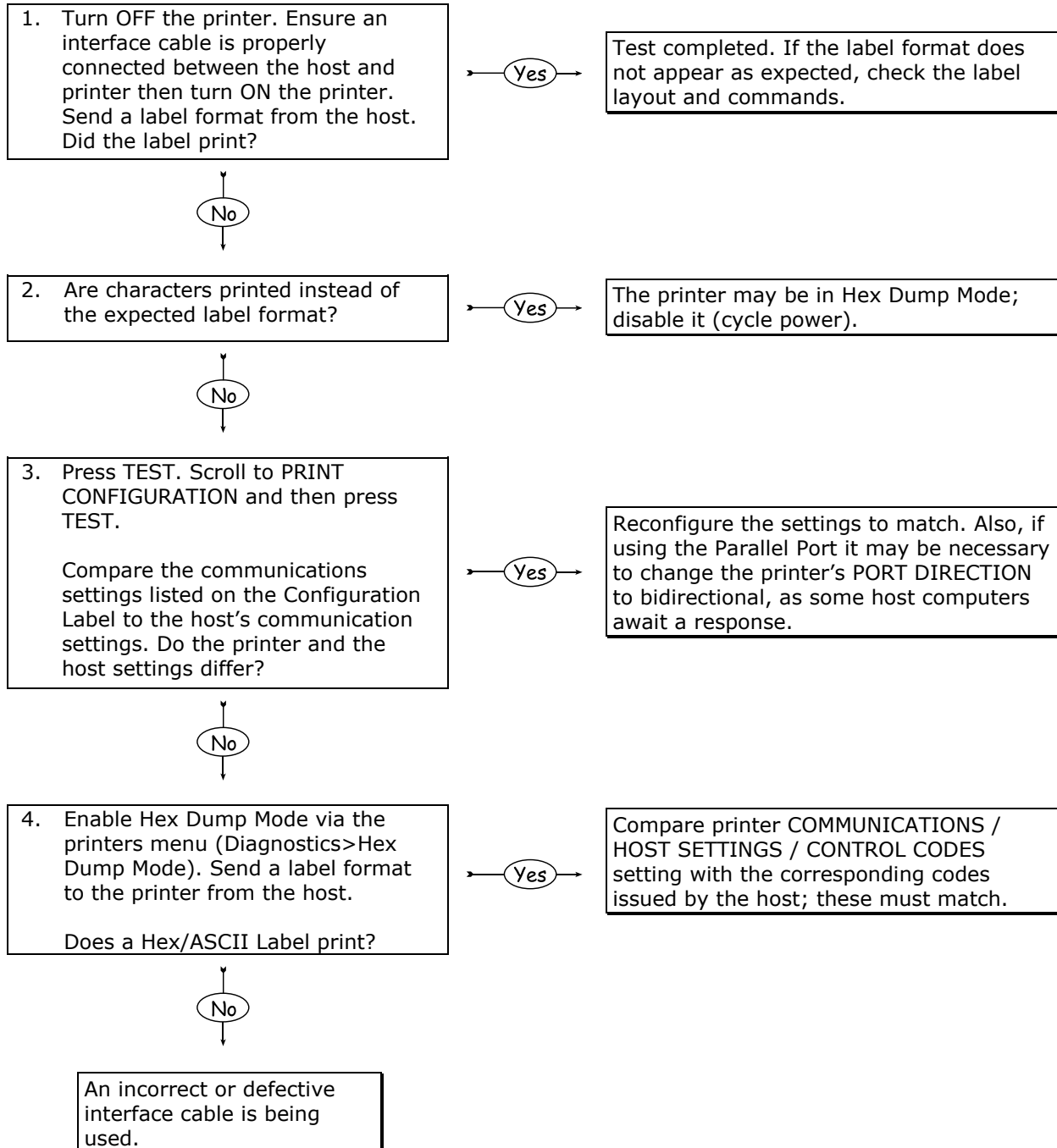
3.2.4   Poor Print Quality

☑ *Note:*   *(1) If printed results are uneven, light or splotchy try increasing HEAT or reducing PRINT SPEED as no further adjustments may be needed; (2) during the procedure below, synthetic media may not produce the intended results due to the requirements of the material; and, (3) in extreme conditions, over-temperature protection circuitry can interrupt printing.*

1. Press TEST.

   Scroll to PRINT QUALITY LABEL and then press TEST.

   Does the produced label have streaks or missing areas of print?

   — (Yes) →

   - The HEAT setting may be too low; raise it.

   - Possible incorrect media & ribbon combination.

   - Possible loose printhead assembly; latch it.

   - Possible dirty, misaligned, or defective printhead; clean, align, or replace it (see Section 2.2 or 4.6, respectively).

   - Possible loose or defective printhead cable.

   - Possible ribbon wrinkle (see Section 2.3).

   - Possible defective Main Logic PCB; replace it (see Section 4.9).

   - Possible dirty or worn Platen; clean or replace it (see Section 2.4.2 or Section 4.4, respectively).

   - Possible wrong firmware; check the version.

   - Possible wrong resolution Printhead (e.g., 203 DPI in a 300 DPI model); see Section 4.6.

   - Possible wrong resolution Drive Motor or motor position (or worn belt on early models); see Section 4.12.

(No)

2. Does the print fade across the width of the label?

   — (Yes) →

   - Leveling Cam may be over-adjusted; adjust it (see Section 2.2.1.)

   - The HEAT setting may be too low; raise it.

   - Possible misaligned printhead; align it (see Section 2.2.3).

   - Possible worn Platen; replace it (see Section 4.4).

(No)

Possible incorrect media & ribbon combination or improper print control adjustments (check the settings –- in some cases, host commands may override menu selections.)

3.2.5   Communications Problems

☑**Note:**   *If troubleshooting an Ethernet or USB equipped printer, refer to the documentation that accompanied the option.*

1.   Turn OFF the printer. Ensure an interface cable is properly connected between the host and printer then turn ON the printer. Send a label format from the host. Did the label print?

→─(Yes)→   Test completed. If the label format does not appear as expected, check the label layout and commands.

(No)

2.   Are characters printed instead of the expected label format?

→─(Yes)→   The printer may be in Hex Dump Mode; disable it (cycle power).

(No)

3.   Press TEST. Scroll to PRINT CONFIGURATION and then press TEST.

Compare the communications settings listed on the Configuration Label to the host's communication settings. Do the printer and the host settings differ?

→─(Yes)→   Reconfigure the settings to match. Also, if using the Parallel Port it may be necessary to change the printer's PORT DIRECTION to bidirectional, as some host computers await a response.

(No)

4.   Enable Hex Dump Mode via the printers menu (Diagnostics>Hex Dump Mode). Send a label format to the printer from the host.

Does a Hex/ASCII Label print?

→─(Yes)→   Compare printer COMMUNICATIONS / HOST SETTINGS / CONTROL CODES setting with the corresponding codes issued by the host; these must match.

(No)

An incorrect or defective interface cable is being used.

3.3 Error Resolution

All functions are monitored during operation and when a problem is detected a corresponding message will be displayed. (If no message appears, see Section 3.2.) In the tables below locate the Displayed Message, the Description, and then use Solution (listed by probability) to isolate the malfunction.

☑ **Note:**   *Warning and Fault Messages are not displayed in Menu or Test Mode.*

3.3.1 Warning Messages

Warning Messages (lasting about five seconds) receive a medium display priority and, if multiples occur, the priority Warning will be displayed.

Displayed Message	Description	Solution	LED Status
Dot Failure	Defective printhead elements have been detected.	Replace the printhead if print quality becomes unacceptable; see Section 4.6.	N/A
Gap Mode Warning Low Backing	A small difference exists between the measured "empty" and "gap" media sensor readings.	This is typical of labels mounted on a transparent backing, or of notched media. A slight delay in Out of Stock detection may be evident; however, no action is required.	N/A
Clean Print Head	The scheduled printhead cleaning distance has been reached.	Clean the printhead; see Section 2.4.1.	RED: ON GREEN: OFF
Ribbon Low	The ribbon supply is almost exhausted.	Load a new roll of ribbon.	RED: ON GREEN: OFF
Printer Cooling	A high printer temperature has been detected.	Wait for the printer to cool, once an acceptable temperature has been reached, operations will automatically resume.	RED: ON GREEN: OFF
Radio Off	The wireless radio is turned off and the printer is set to wireless mode.	Change the connection type to wired mode, or if a wireless connection is desired turn "ON" the Radio via the NETira CT configuration software.	RED: ON GREEN: OFF

3.3.2   Fault Messages

Fault Messages receive the highest display priority and, if multiples occur, messages will cycle.

☑ *Note:*   *To return operation after a fault, correct the condition and then press FEED.*

Displayed Message	Description	Solution	LED Status
Cutter Fault	A blade-positioning fault has occurred.	1) Try cycling printer power OFF and ON. 2) Ensure the media being cut is within specification. ⚠ **WARNING!** Turn OFF and unplug the printer before examining the cutter. 3) Ensure the cutter and cable are properly installed, and that the cutter cable is free of damage. 4) Clear any obstructions from the cutter. 5) The Cutter Motor or Motor Controller PCB may be defective; replace the option. 6) The Main Logic PCB may be defective; replace it (see Section 4.9).	RED: ON GREEN: OFF
Gap Mode Calibration Failed	Consistently low sensor readings were detected.	Press any key to continue. Then, retry STANDARD CALIBRATION, ensuring that media is inserted at the appropriate step (see Section 2.1.3). If this fails, try ADVANCED ENTRY (see Section 2.1.4). If the problem persists, it can be due to one of following reasons: 1) The media is transparent; try installing an alternate media and retry calibration. 2) Possible debris in the Media Sensor; clean it then retry calibration (see Section 2.4.3). 3) The Media Sensor may be defective; replace it (see Section 4.8). 4) The Main Logic PCB may be defective; replace it (see Section 4.9).	N/A

Fault Messages *(continued)*

Displayed Message	Description	Solution	LED Status
Gap Mode Faulty Sensor	Consistently high sensor readings have been recorded.	Press any key to continue. Retry the STANDARD CALIBRATION, ensuring that the backing is inserted and the media withdrawn at the appropriate step (see Section 2.1.3). If the problem persists, it can be due to one of following reasons: 1) Possible debris in the Media Sensor; clean it then retry calibration (see Section 2.4.3). 2) The Media Sensor may be defective; replace it (see Section 4.8). 3) The Main Logic PCB may be defective; replace it (see Section 4.9).	N/A
Clean Print Head	The programmed printhead cleaning distance has been exceeded three times.	Press and hold the TEST Button to initiate cleaning (see Section 2.4.1).	RED: ON GREEN: OFF
Load Media	No media is detected.	Ensure correct media loading and Media Sensor adjustment. Then, if the problem persists, it can be due to one of following reasons: 1) The PAPER OUT DISTANCE SETTING may need to be increased. 2) Calibration may be needed (see Section 2.1.3). 3) The Media Sensor may be defective; replace it (see Section 4.8). 4) The Main Logic PCB may be defective; replace it (see Section 4.9).	RED: ON GREEN: OFF

Fault Messages *(continued)*

Displayed Message	Description	Solution	LED Status
Reflective Mode Calibration Failed	Consistently low sensor readings have been recorded.	Press any key to continue. Retry the STANDARD CALIBRATION, ensuring that the reflective mark is inserted facedown during the appropriate step in the procedure (see Section 2.1.3). If this fails, try ADVANCED ENTRY (see Section 2.1.4). If the problem persists, it can be due to one of following reasons: 1) The reflective marks may not be made of carbon-based ink. 2) Possible debris in the Media Sensor; clean and retry calibration (see Section 2.4.3). 3) The Media Sensor may be defective; replace it (see Section 4.8). 4) The Main Logic PCB may be defective; replace it (see Section 4.9).	N/A
Reflective Mode Faulty Sensor	Consistently high sensor readings have been recorded.	Press any key to continue. Retry the STANDARD CALIBRATION, ensuring that media is removed during the appropriate step in the procedure (see Section 2.1.3). If the problem persists, it can be due to one of following reasons: 1) Possible debris in the Media Sensor; clean it then retry calibration (see Section 2.4.3). 2) The Media Sensor may be defective; replace it (see Section 4.8). 3) Possible defective Main Logic PCB; replace it (see Section 4.9).	RED: ON GREEN: OFF

Fault Messages *(continued)*

Displayed Message	Description	Solution	LED Status
Load Ribbon	No rotation, sporadic movement, or unusable sensor values have been detected for the Ribbon Supply.	Ensure that ribbon is correctly installed, that the Printhead is latched, that the Leveling Cam is adjusted, and that the printer is calibrated (see the *Operator's Manual*). If the problem persists, it can be due to one of following reasons: 1) The Ribbon Supply Hub may be bound; identify then clear the obstruction. 2) The ribbon core may be loose on the Ribbon Supply Hub; install a ribbon with a core that is within specification. 3) The ribbon may be slipping over the media. Possible causes include an incorrect media / ribbon combination, a worn Platen, or a severely misaligned printhead assembly; proceed accordingly. 4) Possible damaged timing disk; replace the Ribbon Supply Hub (see Section 4.14.1). 5) Possible defective Main Logic PCB; replace it (see Section 4.9).	RED: ON GREEN: OFF
Printer Cooling	A high printer temperature has caused a shutdown.	Turn OFF the printer. Then, when cooled, turn ON the printer. If the problem persists, it can be due to one of following reasons: 1) The location may be too hot; move the printer to a place that does not exceed 100°F (38°C) ambient. 2) Enter DIAGNOSTICS / SENSOR READINGS then examine the THR value: If 000 or 255, the Printhead or Printhead Cable may be defective (see Section 4.6).	RED: ON GREEN: OFF

Fault Messages *(continued)*

Displayed Message	Description	Solution	LED Status

Check Supplies	Quick Calibration failed; or, the printer was turned off (or reset) during a ribbon, out of stock or TOF fault condition.
	
	-or-
	
	TOF was not detected within the maximum label length setting, or a TOF was unexpectedly detected.
	
	☑ **Note:** *When the SENSOR TYPE is REFLECTIVE, this fault is given for an out of stock condition.*
		Press the FEED Key then proceed accordingly:
		
		If media moves –
		
		1) The media may be improperly loaded, or calibration may be needed; reload then calibrate (see Section 2.1).
		
		2) Sensor positioning may be required, or the SENSOR TYPE setting may be incorrect; check the position and setting.
		
		3) The Media Sensor may need cleaning (see Section 2.4.3).
		
		4) The Leveling Cam may be improperly set; adjust it (see Section 2.2.1).
		
		5) The label's length may be longer than the MAXIMUM LABEL LENGTH; check and if needed adjust the setting.
		
		7) The Media Sensor may be defective; replace it (see Section 4.8).
		
		If media does *not* move –
		
		Possible defective drive train component. Press the FEED Key, listen for Drive Motor operation, and then proceed accordingly:
		
		• If the Drive Motor is operating, check for a loose or broken drive train component, including a worn roller; or,
		
		• If the Drive Motor is not operating:
		
		  1) The Drive Motor Assembly may be defective; replace it (see Section 4.12).
		
		  2) Power Supply PCB may be defective; replace it (see Section 4.11).
		
		  3) Main Logic PCB may be defective; replace it (see Section 4.9).
			RED: ON
			GREEN: OFF

Fault Messages *(continued)*

Displayed Message	Description	Solution	LED Status
Present Sensor Remove Label	The present sensor (if equipped) has detect a label blocking the sensor.	1) Remove the label if present. 2) The Present Sensor may be defective; replace.	Flashing Yellow GREEN: OFF
GPIO Waiting for Signal	The GPIO option card (if equipped) is awaiting a signal from the host or other remote equipment.	Refer to the GPIO Installation Instructions included with the option or downloaded from www.datamax-oneil.com.	RED: OFF GREEN: ON
GPIO Waiting for Data	The GPIO option card (if equipped) is awaiting data from the host.	Refer to the GPIO Installation Instructions included with the option or downloaded from www.datamax-oneil.com.	RED: OFF GREEN: ON

3.4   Hex Dump Mode

Hex Dump Mode is a diagnostic tool for isolating communications and DPL™ syntax errors, by allowing input (host) data to output (printer) data comparisons. All data received by the printer will be output in hexadecimal code along with the printable ASCII equivalents, as shown below. To identify possible handshaking problems, repeatedly send the format and sections of missing data can become apparent. To debug DPL label formats reference the *DPL Programmer's Manual*.

After sending a label format to the printer, the output will be immediate and in the form shown below. As a final note, many software programs use bit mapping to construct the label making diagnosis difficult. Contact Datamax-O'Neil Technical Support with any questions.

```
0000   02 4C 0D 44 31 31 0D 31   ^L.D11.1
0008   36 31 31 30 30 30 30 33   61100003
0010   32 30 30 30 31 30 46 4F   200010FO
0018   4E 54 20 36 3A 20 41 4C   NT 6: AL
0020   4C 20 56 41 4C 49 44 20   L VALID
0028   20 20 20 20 20 20 20 20
0030   20 20 20 0D 31 36 31 31      .1611
0038   30 30 30 30 32 38 30 30   00002800
0040   30 31 30 20 20 20 20 20   010
0048   20 20 20 43 48 41 52 41      CHARA
0050   43 54 45 52 53 3A 0D 31   CTERS:.1
0058   36 31 31 30 30 30 30 32   61100002
0060   34 30 30 30 31 30 23 24   400010#$
0068   25 26 28 29 2A 2B 2E 2D   %&()*+.-
```

To print a Hex Dump, load four-inch wide media (and ribbon, if thermal transfer printing) then proceed according to the type:

• Turn ON the printer. Enter DIAGNOSTICS and enable HEX DUMP MODE. Exit the menu and save the changes.

☑**Note:**   *To exit Hex Dump Mode, enter DIAGNOSTICS and disable HEX DUMP MODE then exit the menu, saving the changes.*

4.0   Introduction

This section details removal and replacement methods for various printer components; where multiple equipment types or options are available, use the procedure that best matches the configuration.

⚠ **CAUTION**	▸ Always disconnect AC power before performing service; ▸ Wear a wrist strap and follow all ESD prevention measures; and, ▸ Use extreme care and never use sharp objects on the Printhead or Platen.

☑ **Note:**   *The procedures below assume a printer empty of media and ribbon.*

4.1   Cover Assembly

Removal:

1. Turn OFF and unplug the printer.

2. Remove the three Screws that secure the Cover Assembly to the Baseplate.
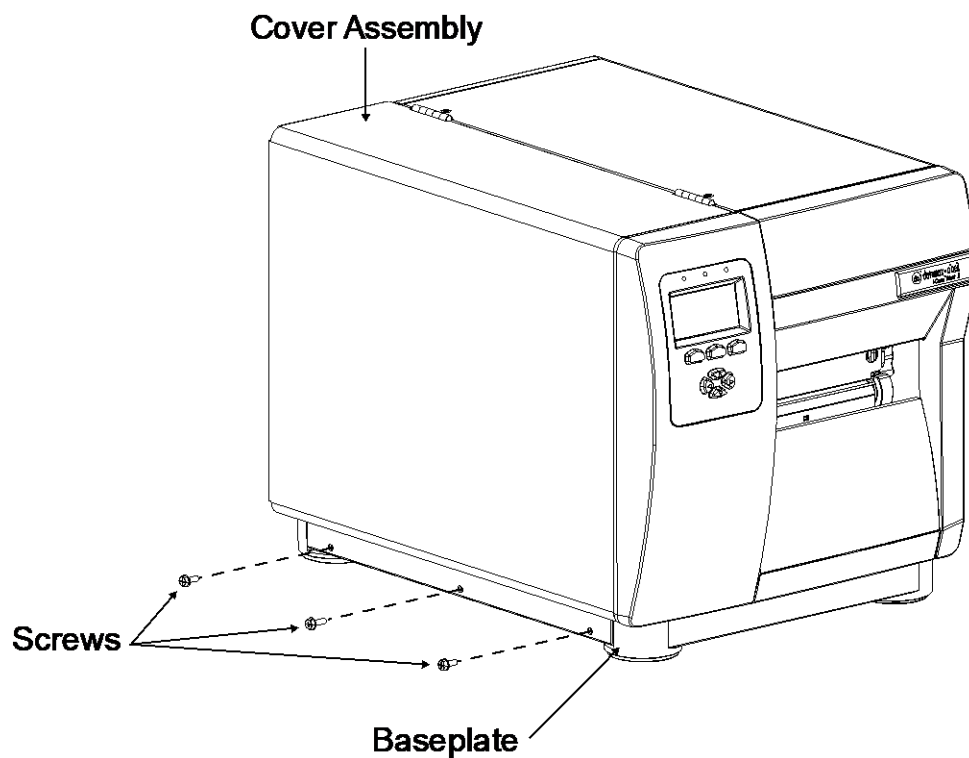
3. Raise the Cover Assembly and loosen the three Screws that secure it to the Centerplate, and then lift the entire Cover Assembly off the printer.
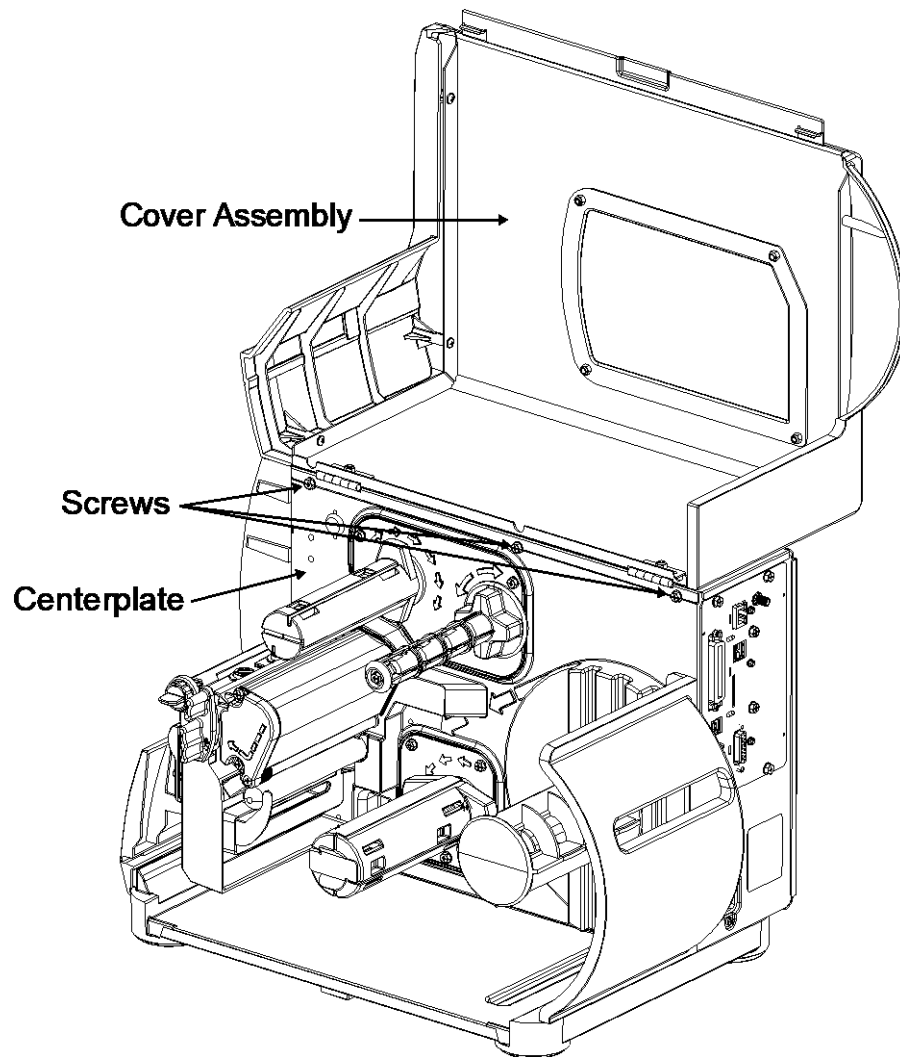
Replacement:

1. Lower the Cover Assembly onto the printer.

2. Reinstall the three Screws through the Cover Assembly and into the Baseplate.

3. Tighten the three Screws along the inside of the cover.

4.2   Front Panel Fascia

Removal:

1. Turn OFF and unplug the printer.

2. Remove the Cover Assembly (see Section 4.1).

3. Slightly flex the Tabs that extend through notches in the Centerplate and then remove the Front Panel Fascia.
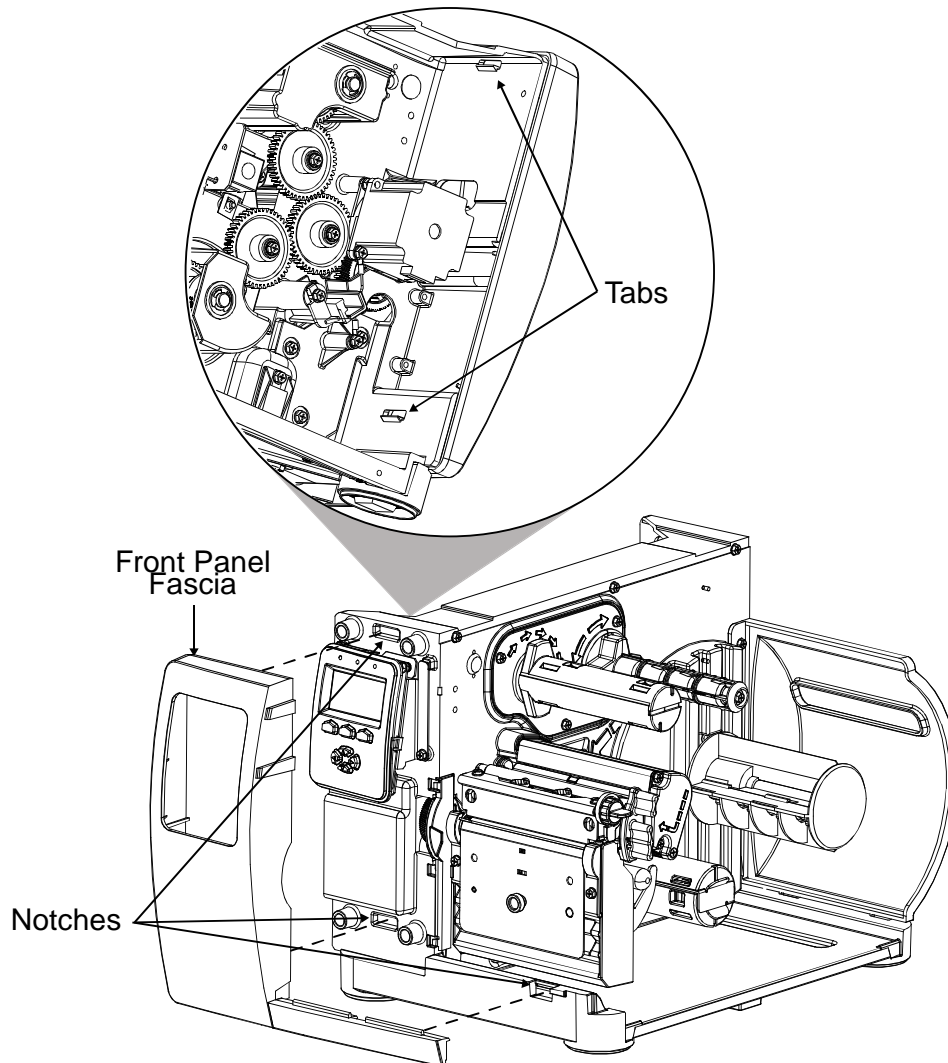
Replacement:

1. Align the Tabs of the Front Panel to the Centerplate Notches.

2. Press firmly until the Tabs of the Front Panel lock into place.

3. Reinstall the Cover Assembly (see Section 4.1).

4.3   Front Panel Assembly

Removal:

1. Remove the Cover and Front Panel Fascia; see Section 4.1 & 4.2.

2. Remove the two Screws that secure the Front Panel Assembly to the Centerplate then disconnect the Front Panel Cable and remove the Front Panel Assembly from the printer.
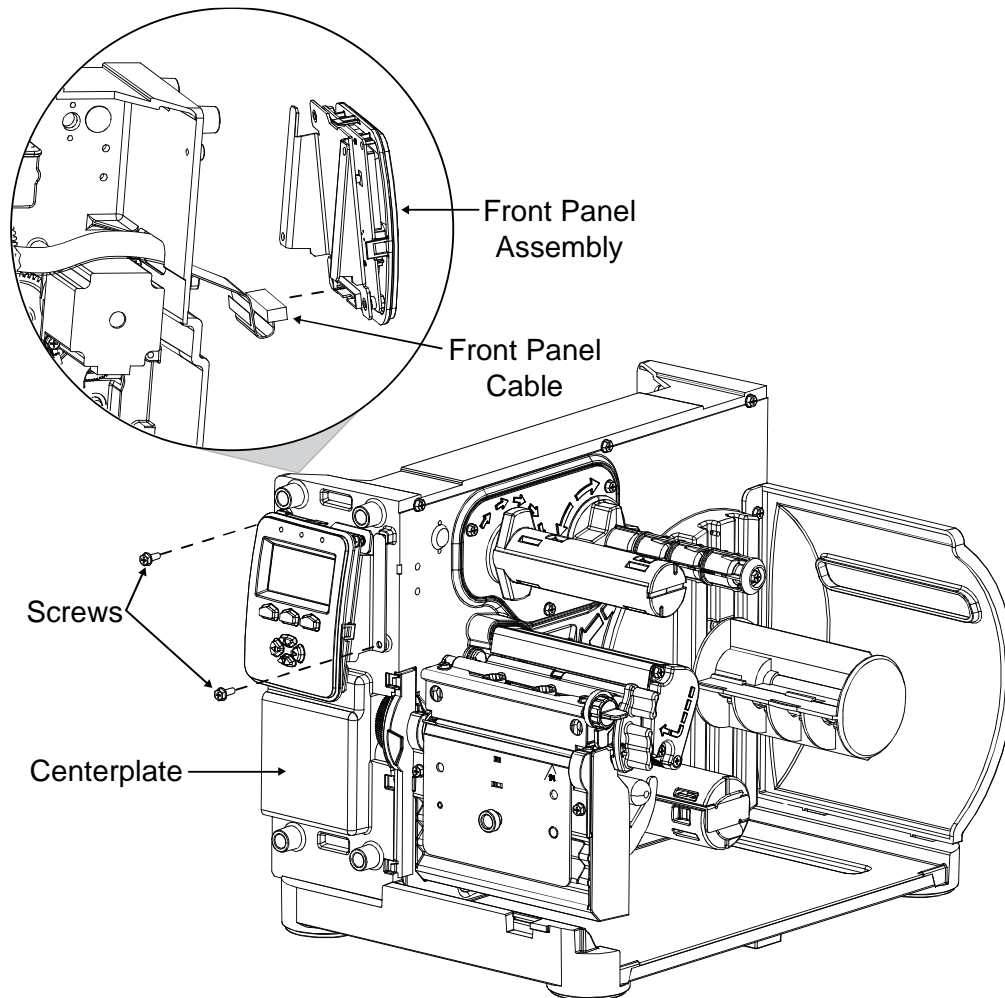
Replacement:

1. Connect the Front Panel Cable to the Front Panel Assembly and then attach the Front Panel Assembly to the Centerplate with the two Screws.

2. Reinstall the Cover and Front Panel Fascia; see Section 4.1 & 4.2.

4.4   Platen

Removal:

1. Turn OFF and unplug the printer.

2. Raise the cover and remove the Tearplate Fascia, Thumbscrew, and Tearplate.

3. Remove the Gear Cover by pulling the far side out then away from the Centerplate.

> ☑ **Note:** *If necessary, loosen the Front Panel Fascia to facilitate removal; see Section 4.2.*

Gear Cover

Tearplate

Thumbscrew

Tearplate Fascia
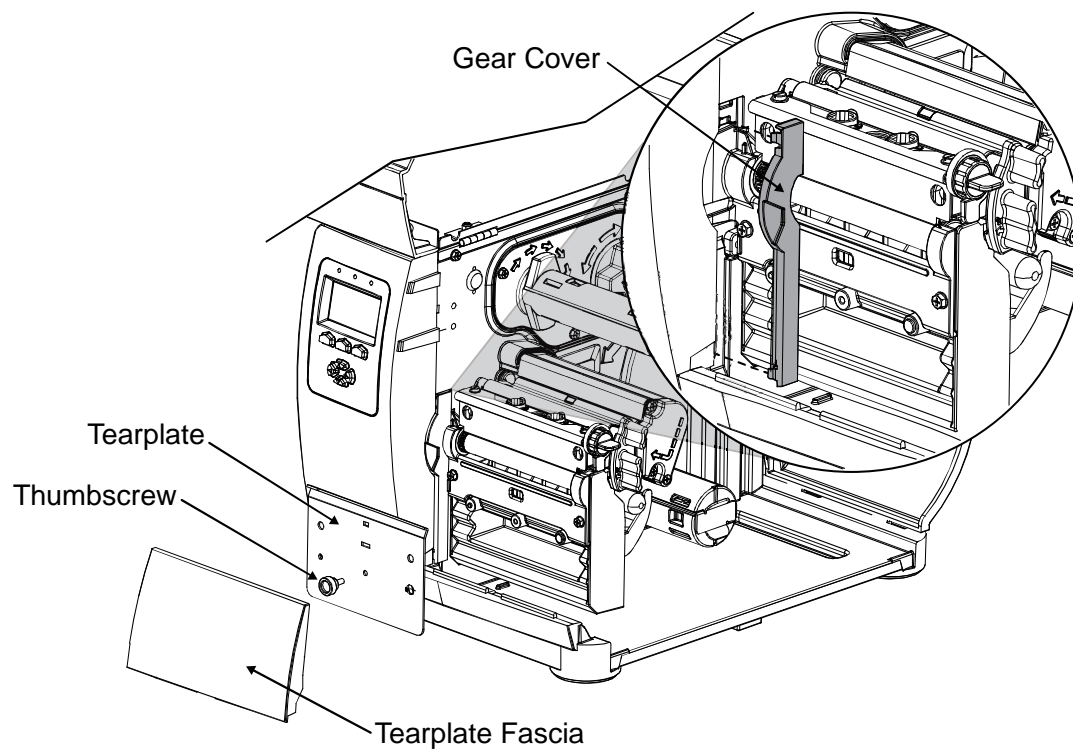
4. Remove the two Screws that secure the Bearing Plate and then remove the Bearing Plate from the Platen Block.

Bearing Plate

Screws
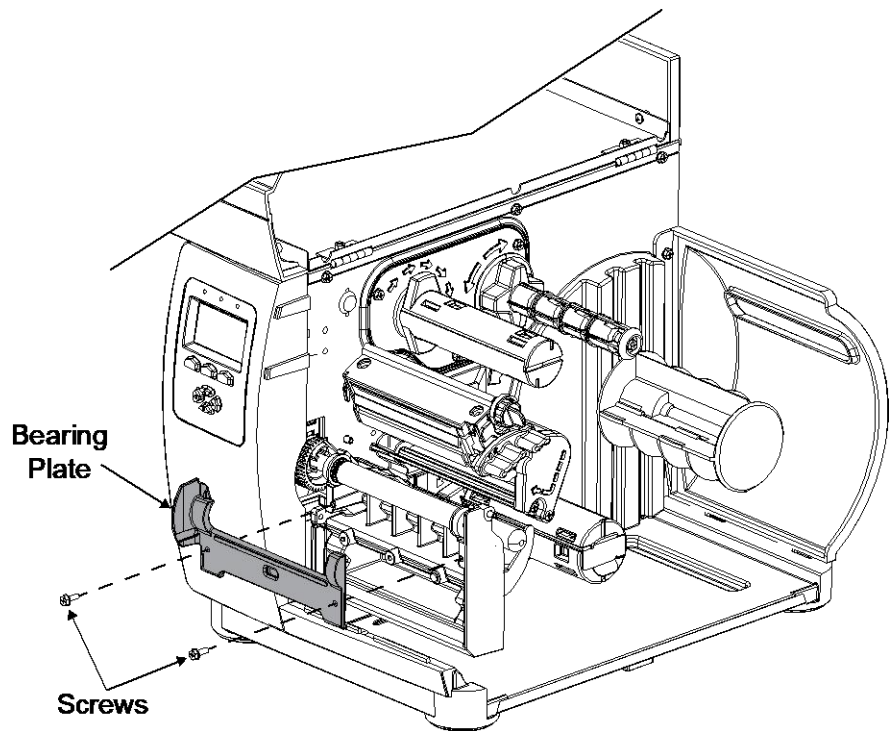
5. Remove the Platen Assembly from the Platen Block. Pivot the Platen Assembly as shown to remove it from the printer.

    If necessary, loosen the Front Panel Fascia to facilitate removal; see Section 4.2.

Platen Assembly
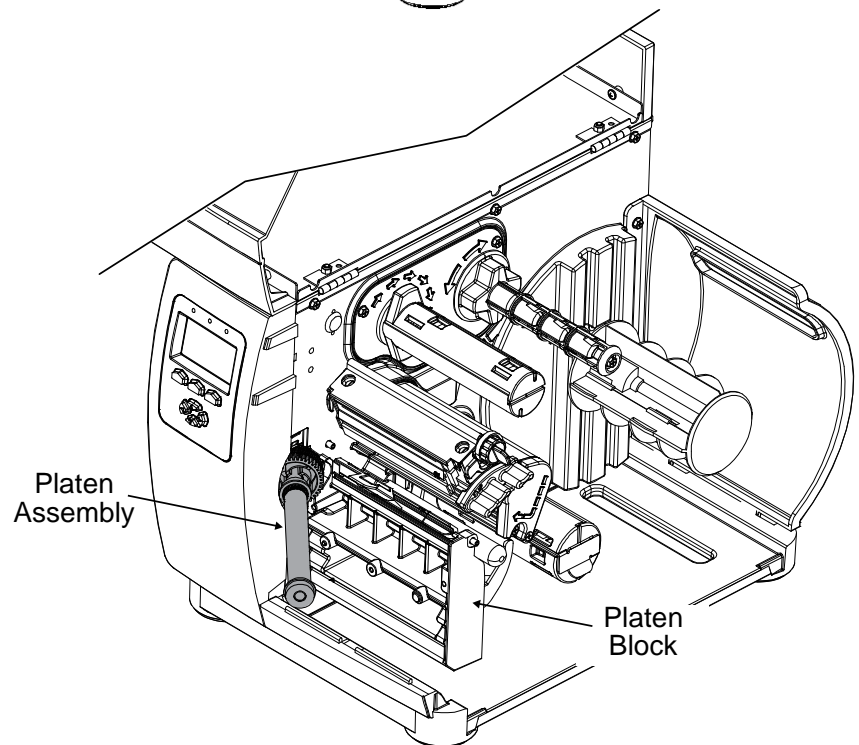
Platen Block

Replacement:

1. Place the Platen Assembly into the Platen Block, ensuring proper gear mesh.

2. Position the Bearing Plate onto the Platen Block and secure it with the two Screws.

3. Position and then snap the Gear Cover into place.

4. Clean the Platen; see Section 2.4.2.

5. Replace the Tearplate, Thumbscrew, and the Tearplate Fascia.

4.5   Platen Block

Removal:

1. Turn OFF and unplug the printer.

2. Remove the Cover and Platen; see Section 4.1 & 4.4

3. Remove the three Screws securing the Platen Block to the Centerplate. Slide the Platen Block out of the printer.

Screws
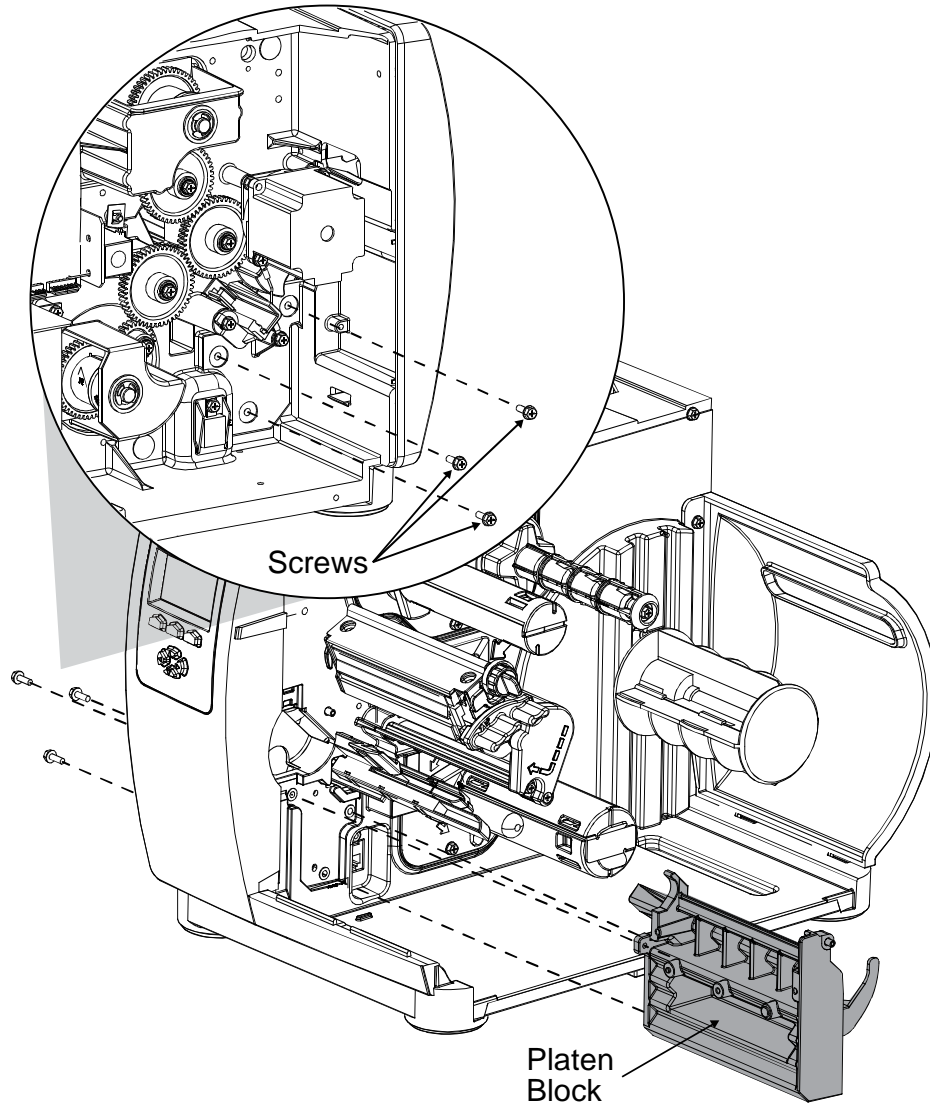
Platen Block

Replacement:

1.   Position the Platen Block in the printer against the Centerplate.

2.   Install the three Screws to secure the Platen Block to the Centerplate.

3.   Install the Platen and Cover; see Section 4.4 & 4.1.

4.6   Printhead

⚠ **CAUTION**   Use extreme care when handling the printhead.

Removal:

1. Turn OFF and unplug the printer.

2. Raise the cover. With the Printhead Assembly lowered, loosen the Printhead Mounting Screw (it will remain in the assembly).

Printhead
Assembly

Printhead
Mounting Screw
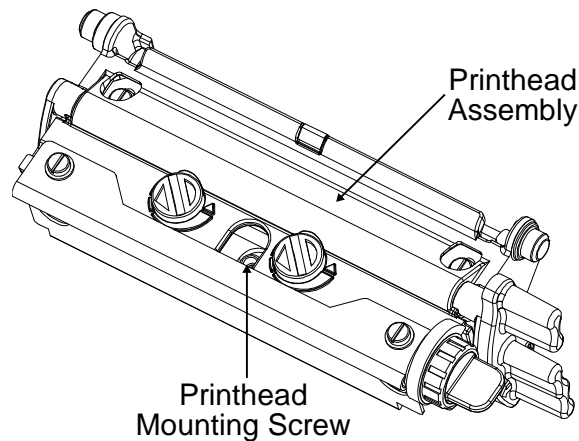
3. While carefully supporting the Printhead, raise the Printhead Assembly and disconnect the cables. Then remove the Printhead from the Printhead Assembly.

Printhead
Cables
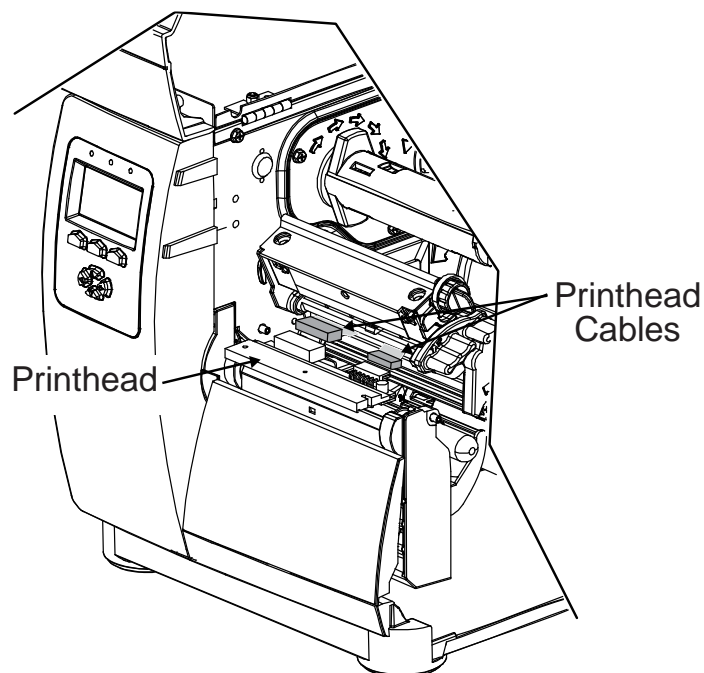
Printhead

Replacement:

1. Carefully reconnect both cables to the Printhead.

2. Position the Printhead onto the Locating Pins in the Printhead Assembly.
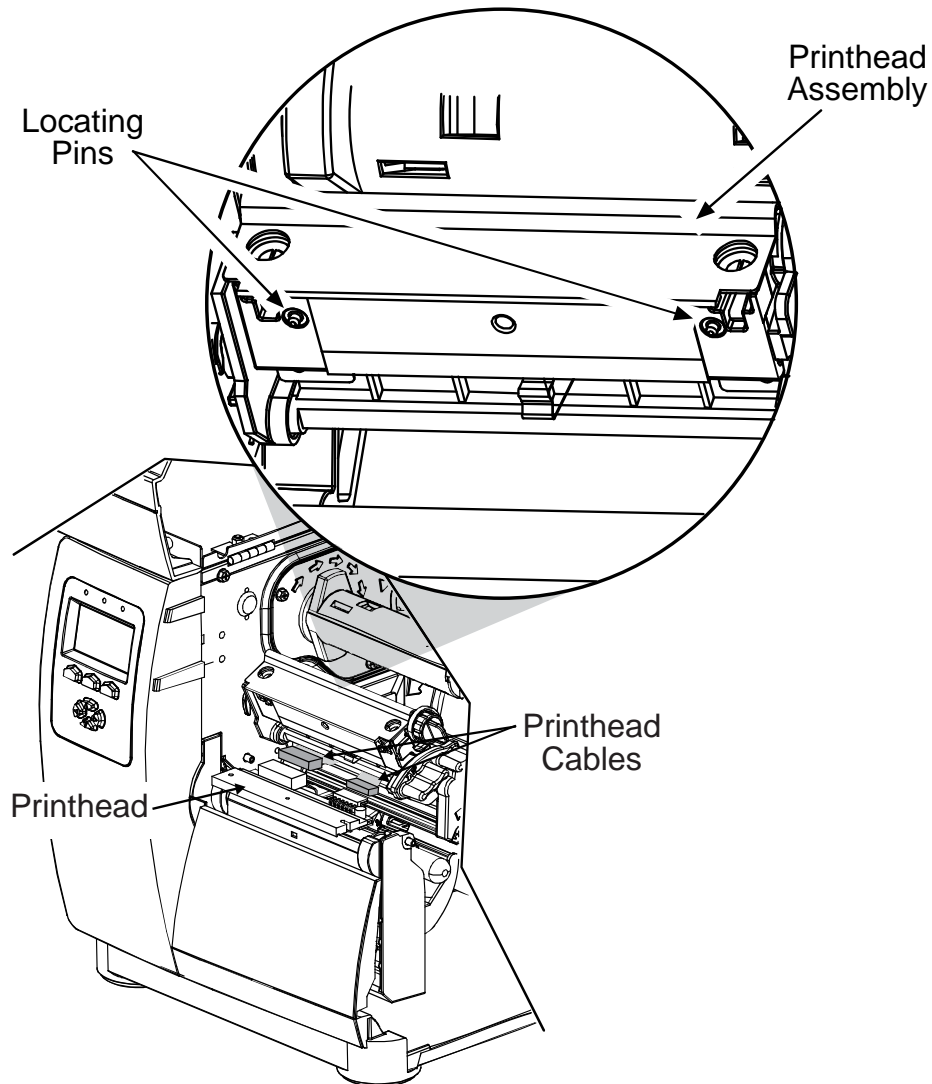
3. Secure the Printhead to the Printhead Assembly with the Printhead Mounting Screw, but do NOT over-tighten.

4. Clean the Printhead; see Section 2.4.1.

5. Lower and latch the Printhead Assembly.

6. Adjust the Darkness setting (within the printer's menu; see the Operator's Manual for more information) to match the print contrast of the replaced printhead.

☑ **Note:**   *Burn Line adjustment is not normally required as part of the replacement process; however, if necessary, see Section 2.2.3.*

4.7   Printhead Assembly

Removal:

1. Turn OFF and unplug the printer.

2. Remove the Printhead; see Section 4.4.

3. Remove the two Screws that secure the End Cap to the Extrusion.

4. While supporting the Printhead Assembly, remove the End Cap, Wavy Washer, and Bushings, (note Bushings may remain captive in the End Cap.
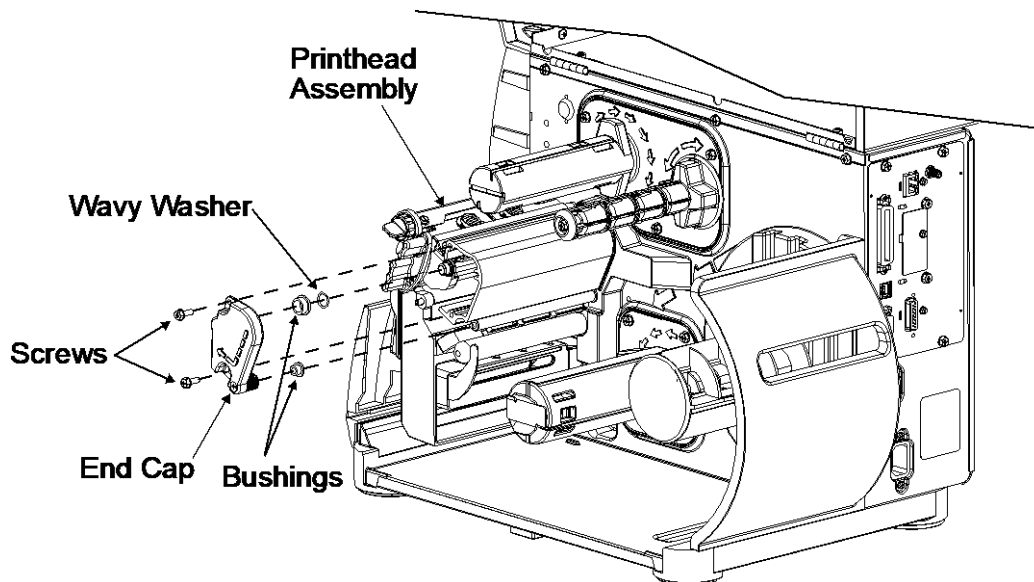
5. Remove the Printhead Assembly and the Head Lift Spring.
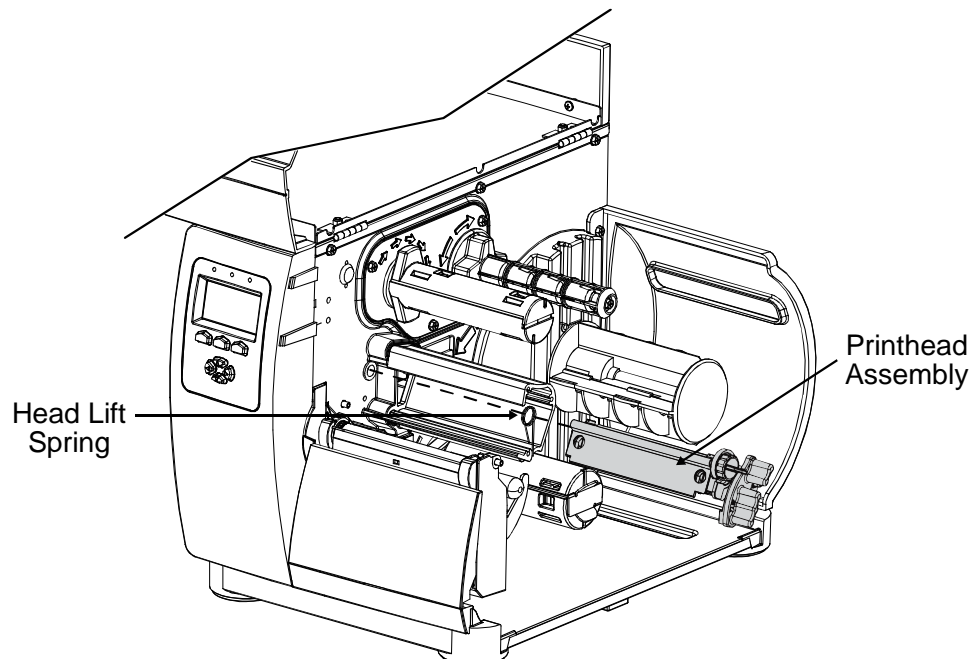
Replacement:

1. Place the Head Lift Spring onto the Printhead Assembly Boss; situate the Short Leg behind the Tab.
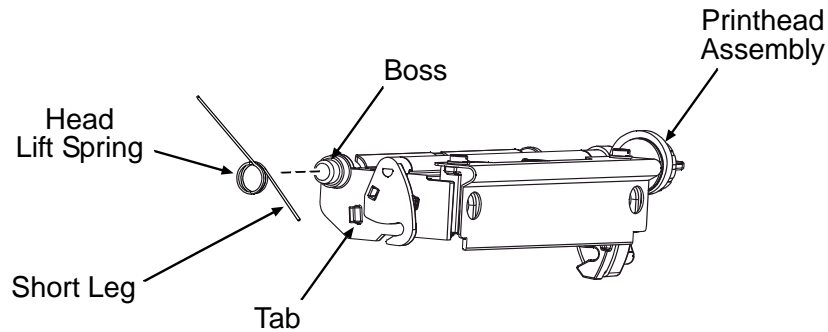
2. Rotate the Long Leg of the Head Lift Spring downward, loading it against the Extrusion, and then insert the Printhead Boss into the Centerplate bushing.

3. While holding the spring-loaded Printhead Assembly in the Centerplate bushing, place the Wavy Washer onto the (opposite) Printhead Assembly Boss.
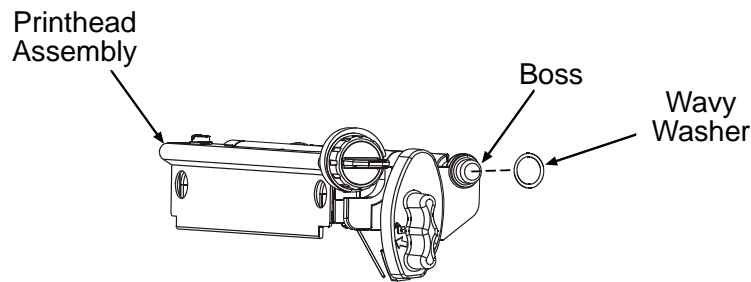
4. If removed, insert the Ribbon Idler shaft into the Centerplate bushing.

5. With the bushings installed in the End Cap, reinstall the End Cap onto the Extrusion to captivate the Printhead Assembly Boss and Ribbon Idler shaft. Then secure the End Cap with the two Screws.

6. Test the Printhead Assembly for correct movement and latching; also, check the Ribbon Idler for proper rotation.

7. Reinstall the Printhead; see Section 4.4.

4.7.1   Printhead Assembly Breakdown

Within the Printhead Assembly, there are several serviceable parts and sub-assemblies. The following section is an overview of the breakdown of the Printhead Assembly, refer to the I-Class Mark II Parts Catalog for available parts.

Removal:

1. Remove the Printhead Assembly; see Section 4.7.

2. Carefully pry the Clip from the Printhead Assembly. Also, remove the two Screws that secure the Ribbon Shield and then remove it from the Printhead Assembly.
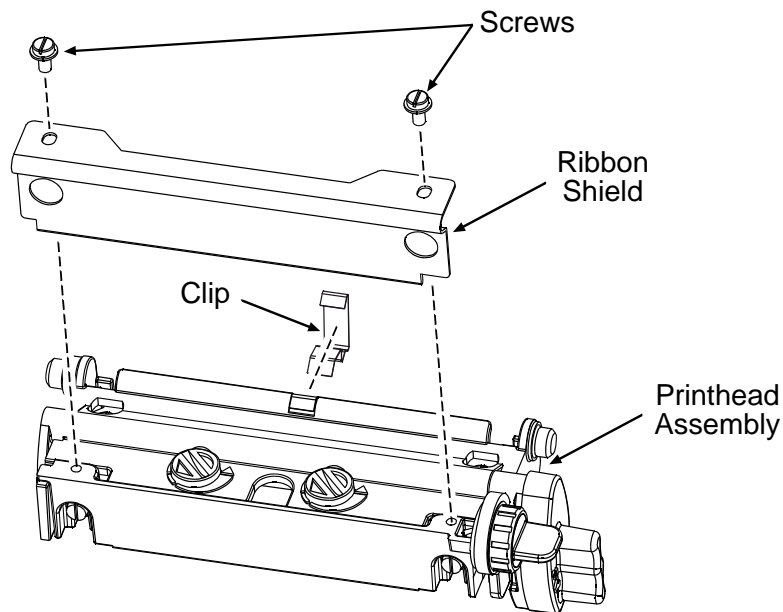
3. Remove the Locking Screws and the Alignment Screws.
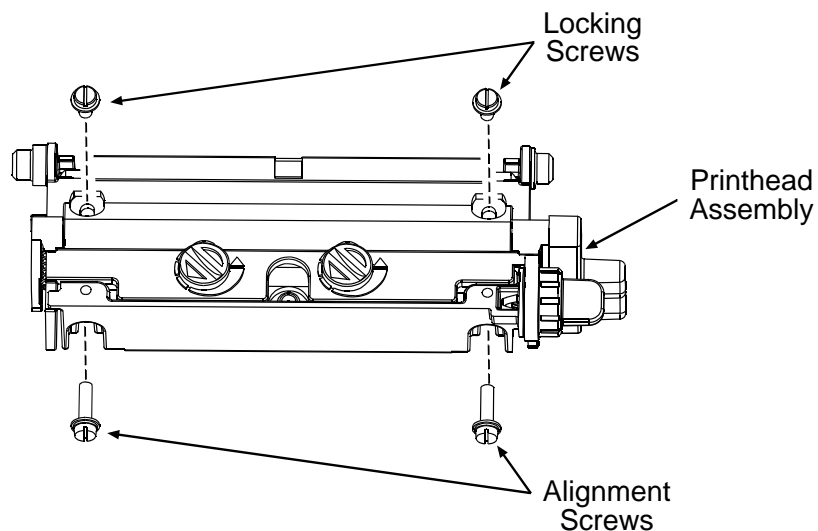
4. Carefully separate the Lower Carriage from the Printhead Assembly, compressing the spring-loaded assembly as necessary to separate the parts, and then remove the Alignment Springs.
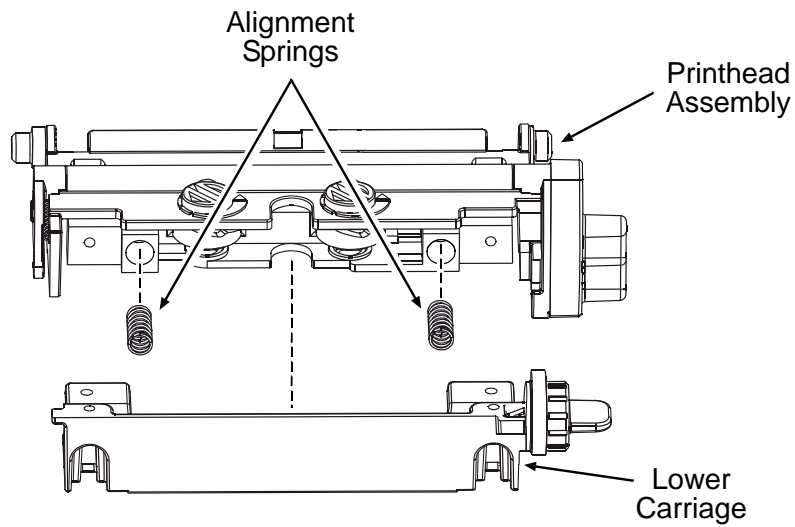
5. Separate the Middle Carriage from the Upper Carriage then remove the Cams and the Pressure Springs.
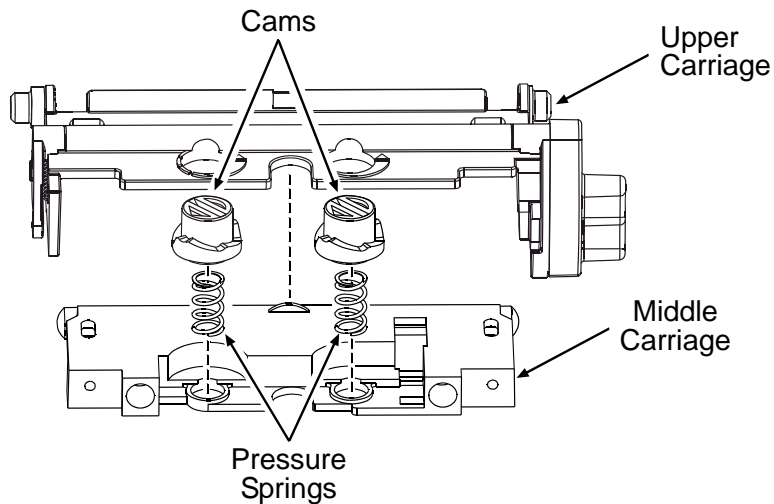
Replacement:

1. Place the Pressure Springs and the Alignment Springs into the sockets of the Middle Carriage and place the Cams into the socket holes of the Upper Carriage then orient the Cam Indicators for least pressure (see below).

Cam
Indicators
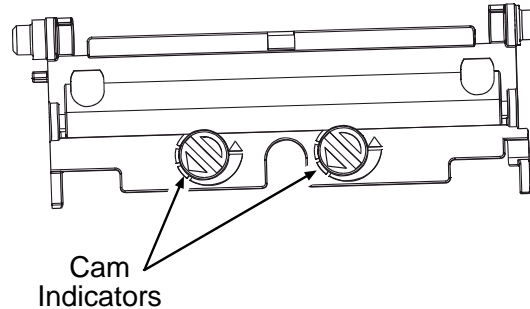
2. Insert the Pressure Springs in the Cams then compress the Upper and Middle Carriage and attach the Lower Carriage to the assembly.

3. Secure (but do not tighten) the Upper, Middle, and Lower Carriages with the Alignment Screws and the Locking Screws.

4. Reinstall the Clip and secure the Ribbon Shield to the Printhead Assembly with the two Screws.

5. Reinstall the Printhead Assembly; see Section 4.7.

6. Adjust the Pressure; see Section 2.2.2.

7. Adjust the Burn Line; see Section 2.2.3.

8. If equipped with Thermal Transfer, align the Ribbon Path; see Section 2.3.

4.8   Media Sensor

Removal:

1. Turn OFF and unplug the printer.

2. Remove the Cover Assembly; see Section 4.1.

3. Disconnect the Media Sensor cable and remove the Screw that secures the Media Sensor Guide to the Post.

4. Pull the Media Sensor Guide and then the Media Sensor from the printer.
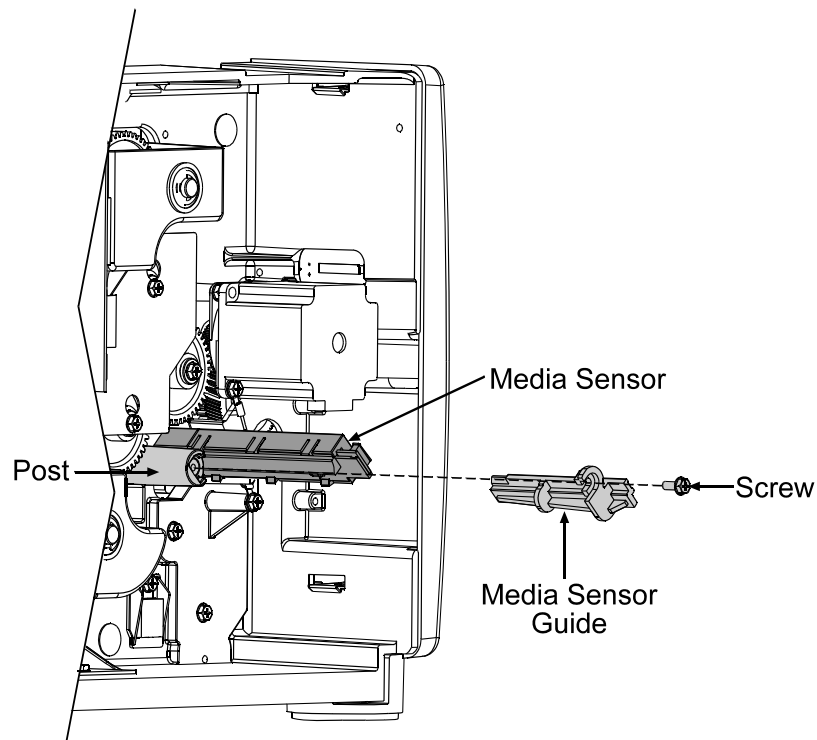
Replacement:

1. Reinstall the Media Sensor and then the Media Sensor Guide.

2. Secure the Media Sensor Guide to the Post with the Screw.

4.9   Main Logic PCB

Removal:

1. Turn OFF and unplug the printer. Remove the Cover Assembly (see Section 4.1).

2. Disconnect the interface cable(s) from the Main Logic PCB.

3. Remove the four Screws on the rear of the printer that secure the Main Logic PCB.

4. Slide out the Main Logic PCB from the printer.
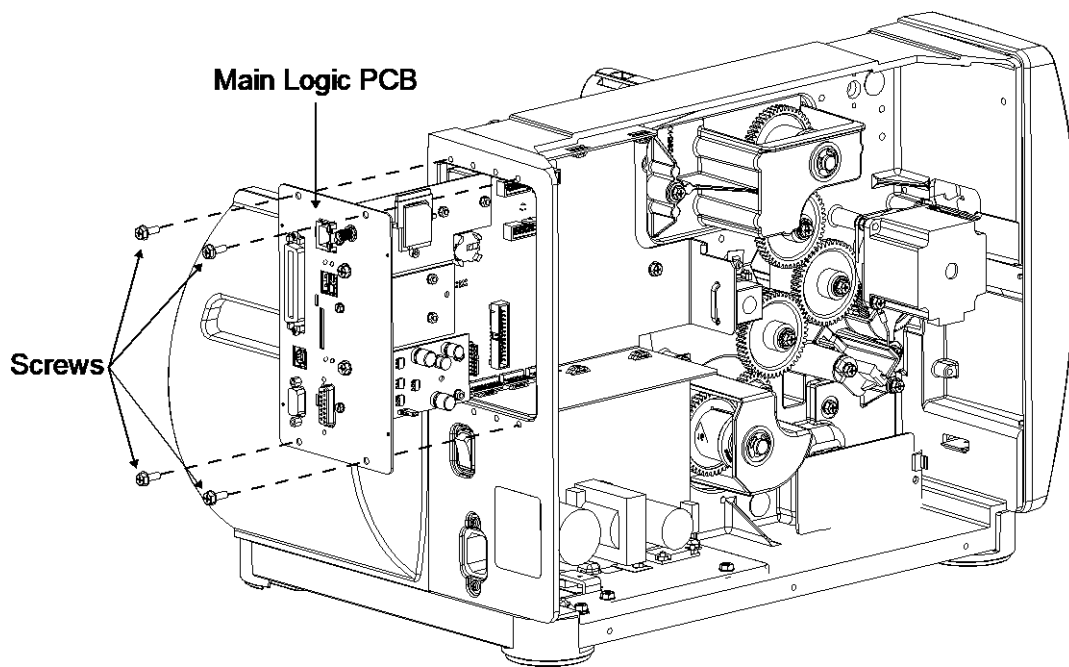
Replacement:

1. If necessary transfer any option cards to the new replacement Main Logic PCB.

2. Insert the Main Logic PCB into the printer then slide it forward until seated.

3. Reinstall the four previously removed screws that secure the Main Logic PCB.

4. Reinstall the cable(s).

5. Verify the installed Firmware Version for the printer and update if necessary; see Section 2.5.

6. Perform a media calibration; see Section 2.1

4.10   Fuses

> ⚠️ **CAUTION**
>
> ▶ Only use a replacement fuse with the rating and type as the original fuse; failure to comply could cause serious damage, including fire.
>
> ▶ Use caution when replacing Fuse F1, as this fuse will only blow during a failure in the primary switching circuit and may indicate a more serious electrical problem.

Removal:

1. Turn OFF and unplug the printer.

2. Remove the Cover Assembly; see Section 4.1.

3. Remove Fuses F1 and/or F2 from the Power Supply PCB.

Fuses
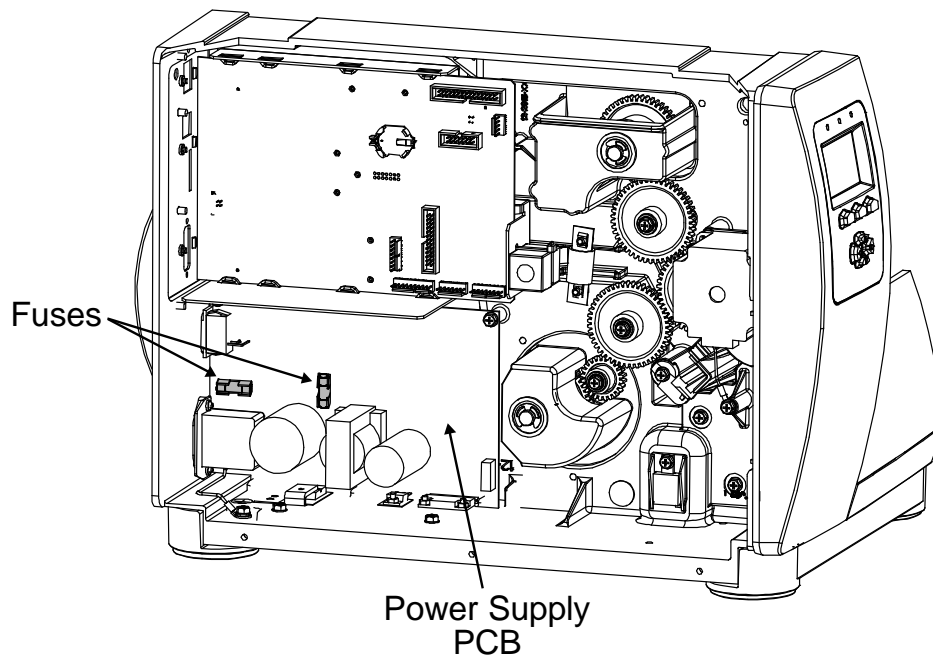
Power Supply
PCB

Replacement:

1. Only replace the defective fuse(s) with the same type and rating as the factory original:

   • Fuse F1 & F2: Fast acting, 3 amps @ 250 Volts, 5 x 20 mm.

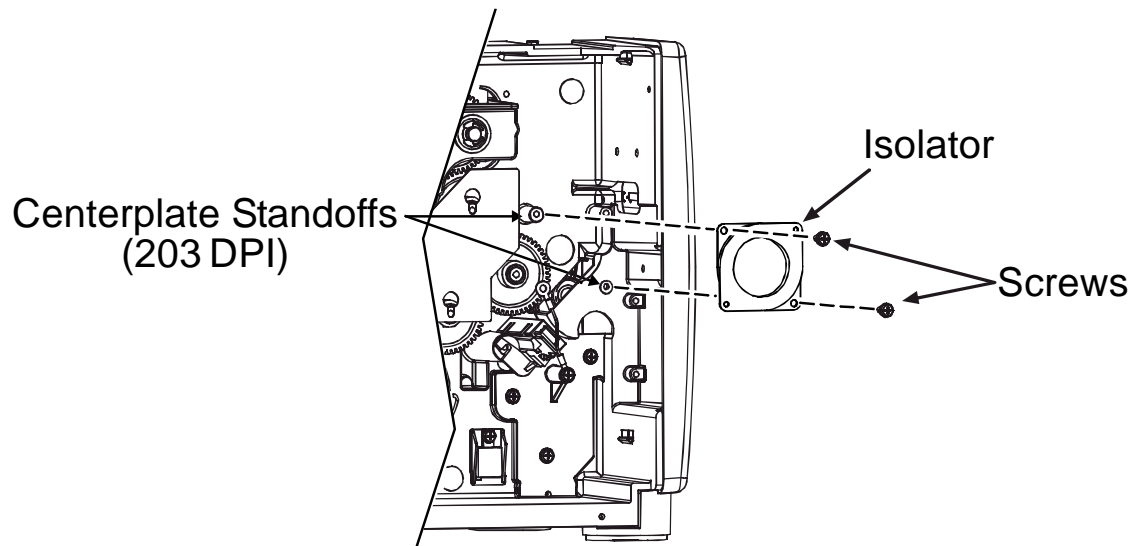2. Reinstall the Cover Assembly; see Section 4.1.

4.11   Power Supply PCB

Removal:

1.   Turn OFF and unplug the printer.

2.   Remove the Cover Assembly; see Section 4.1.

3.   Disconnect the cables from the Power Supply PCB.

4.   Remove the two Screws and Nut Plate that secure the AC Connector.
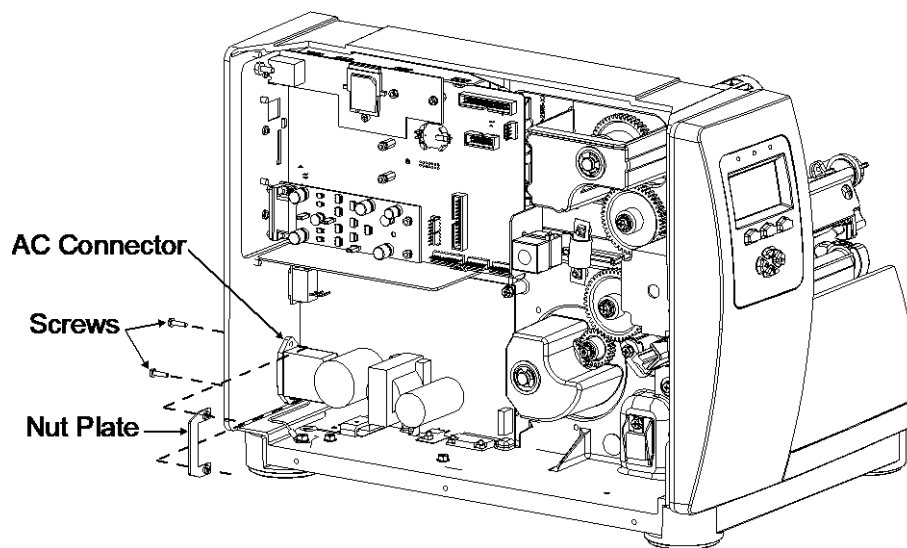
5.   Remove the Screw and Washer that secures the Ground Wire Lug to the chassis.

6.   Remove the four Screws that secure the Power Supply PCB and then remove the Power Supply PCB.
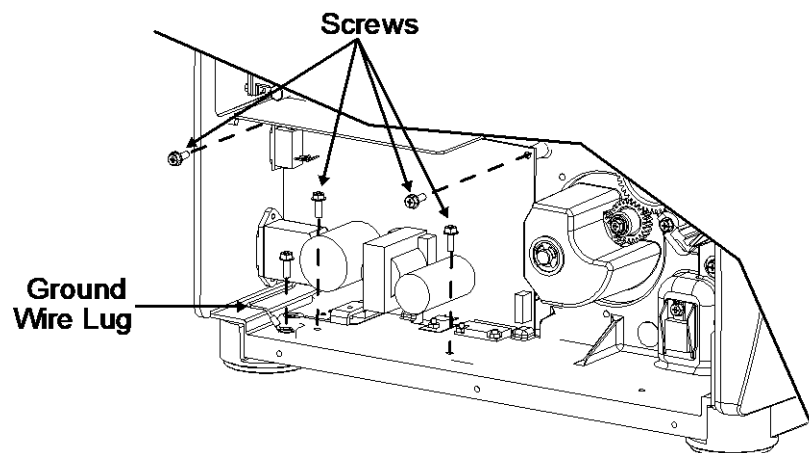
Replacement:

1. Position the Power Supply PCB in the printer then secure it with the four Screws.

2. Place the Washer onto the Screw, and then secure the Ground Wire Lug to the chassis with the Screw.

3. Position the Nut Plate over the AC Connector and then secure the AC Connector and the Nut Plate to the chassis with the two Screws.

4. Reconnect the cables to the Power Supply PCB.

5. Verify the correct Printhead supply voltage; see Section 2.2.4.

4.12   Drive Motor Assembly

Removal:

1. Turn OFF and unplug the printer.

2. Remove the Cover Assembly; see Section 4.1.

3. Disconnect the motor cable.

4. Remove the two Screws that secure the Drive Motor to the Isolator (which also frees the Ground Cable) and then remove the Drive Motor.

5. Remove the two Screws that secure the Isolator and remove.
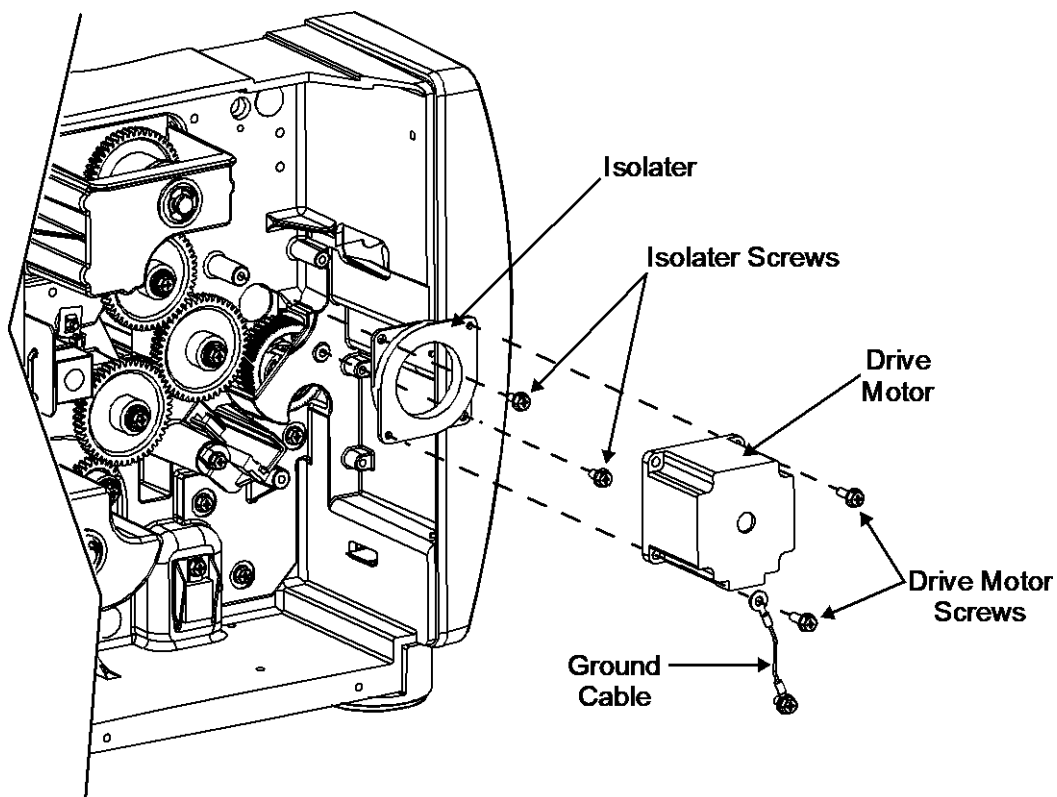
Replacement:

1. Position the Isolator against the Centerplate Standoffs then secure it with the two Screws.

2. Position the Drive Motor against the Isolator.

3. Place the Ground Cable Lug onto one Screw then secure the Drive Motor to the Isolator with the two Screws.

4. Reconnect the motor cable to the Drive Motor.

5. Reinstall the Cover Assembly; see Section 4.1.

4.13   Media Supply Hub

Removal:

1. Turn OFF and unplug the printer.

2. Remove the Cover Assembly; see Section 4.1.

3. Remove the Power Supply PCB; see Section 4.11.

4. Remove the Screw securing the Media Hub Assembly to the Printer.
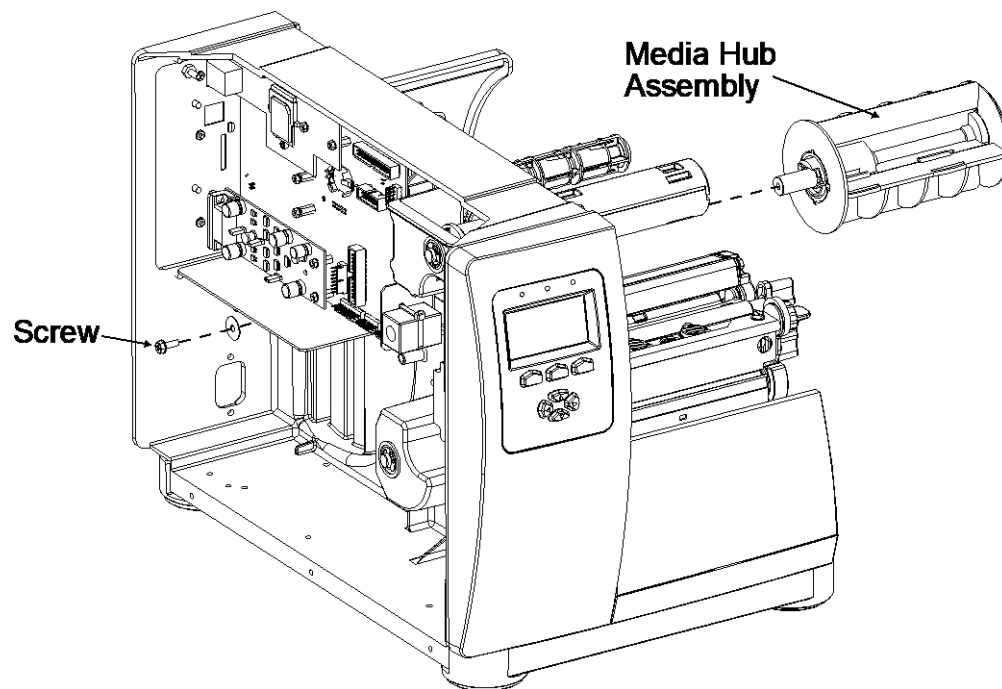
Replacement:

1. Install the Screw securing the Media Hub Assembly to the Printer.

2. Reinstall the Power Supply PCB; see Section 4.11.

3. Remove the Cover Assembly; see Section 4.1.

4.14   Thermal Transfer Assembly

Removal:

1. Turn OFF and unplug the printer. Raise the cover.

2. Remove the three Screws that secure the Thermal Transfer Assembly and then remove the assembly from the Centerplate.
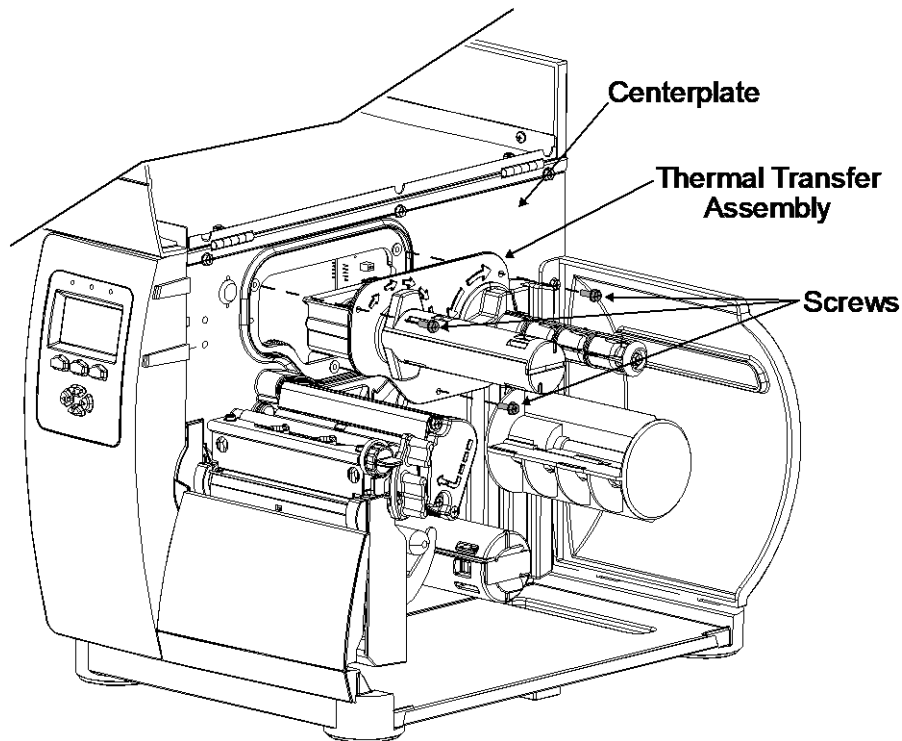
Replacement:

1. Reinstall the Thermal Transfer Assembly in the Centerplate, carefully engaging the gears, and secure it using the three Screws.
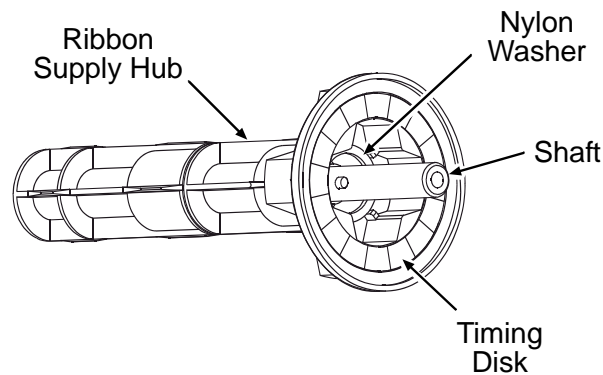
4.14.1 Ribbon Supply Hub

Removal:

1. Remove the Thermal Transfer Assembly; see Section 4.14.

2. Remove the Screw and Metal Washer that secures the Ribbon Supply Hub to the Housing.

3. Remove the Ribbon Supply Hub and Nylon Washer from the Housing.
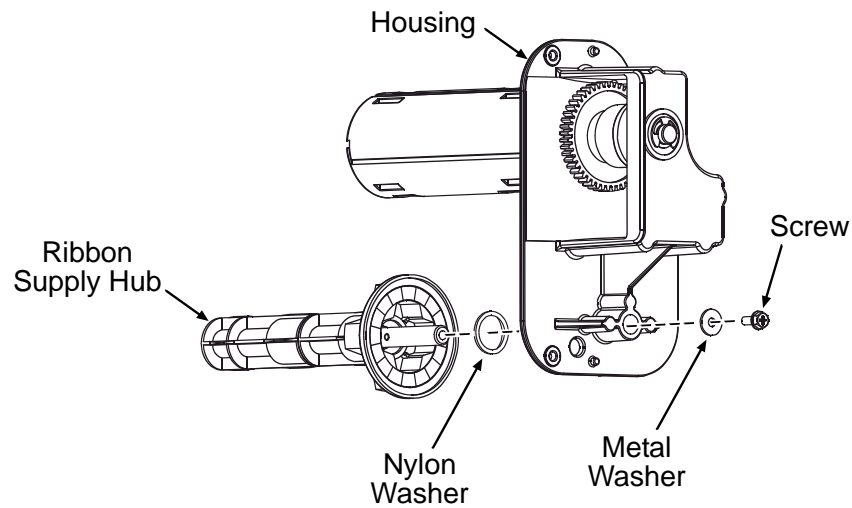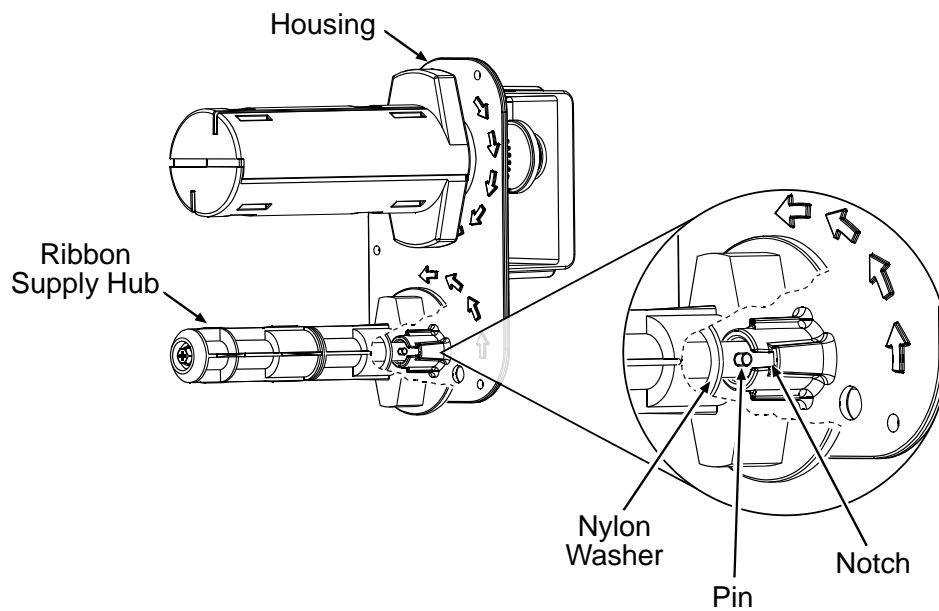

Replacement:

1. Place the Nylon Washer over the Shaft into the Ribbon Supply Hub housing.

2. Slide the Ribbon Supply Hub shaft into the Housing.

3. Rotate the Ribbon Supply Hub until the Pin engages the Notch in the Housing.


4. Secure the Ribbon Supply Hub to the Housing with the Metal Washer and Screw.

5. Reinstall the Thermal Transfer Assembly; see Section 4.14.

4.14.2 Ribbon Take-up Hub & Clutch Assembly

Removal:

1. Remove the Thermal Transfer Assembly; see Section 4.14.

2. Remove the E-Ring from the Take-Up Hub shaft and then remove the Inner Bearing.

3. Remove the Take-Up Hub and the Outer Bearing from the Thermal Transfer Housing.

4. Slightly compress the Take-Up Hub Clutch then remove it from the Thermal Transfer Housing.
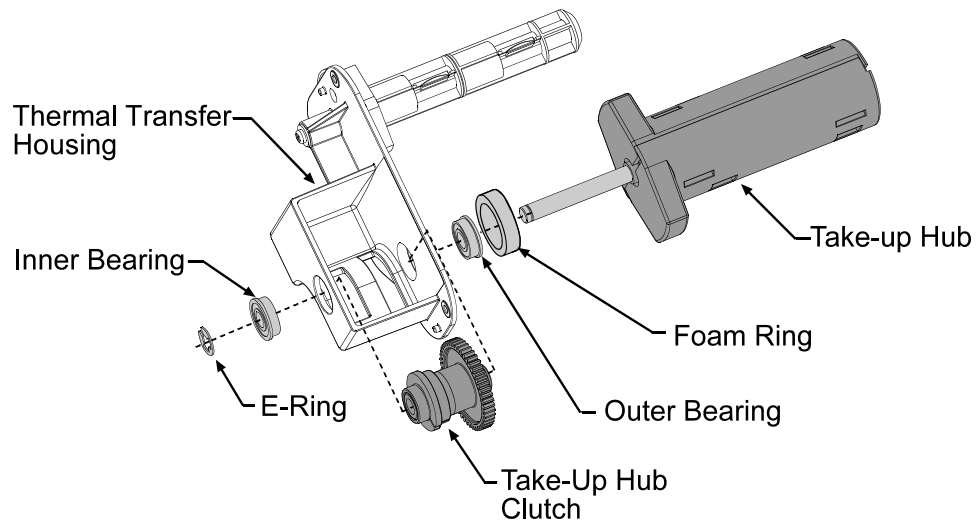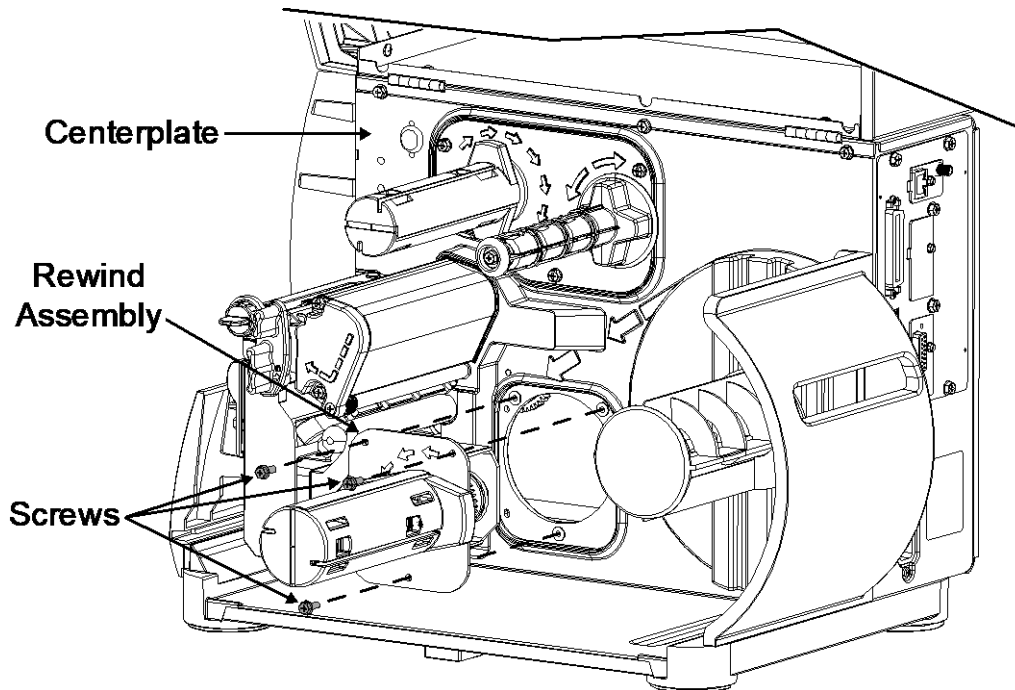

Replacement:

1. Reinstall the Outer Bearing in the Thermal Transfer Housing.

2. Position the Take-Up Hub Clutch in the Thermal Transfer Housing

3. Slide the Take-Up Hub shaft through the Take-Up Hub Clutch and Thermal Transfer Housing.

4. Reinstall the Inner Bearing and clip the E-Ring onto the Take-Up Hub shaft.

5. Reinstall the Thermal Transfer Assembly; see Section 4.14.

4.15 Rewind Assembly

Removal:

1. Turn OFF and unplug the printer. Raise the cover.

2. Remove the three Screws that secure the Rewind Assembly to the Centerplate then remove the Rewind Assembly.
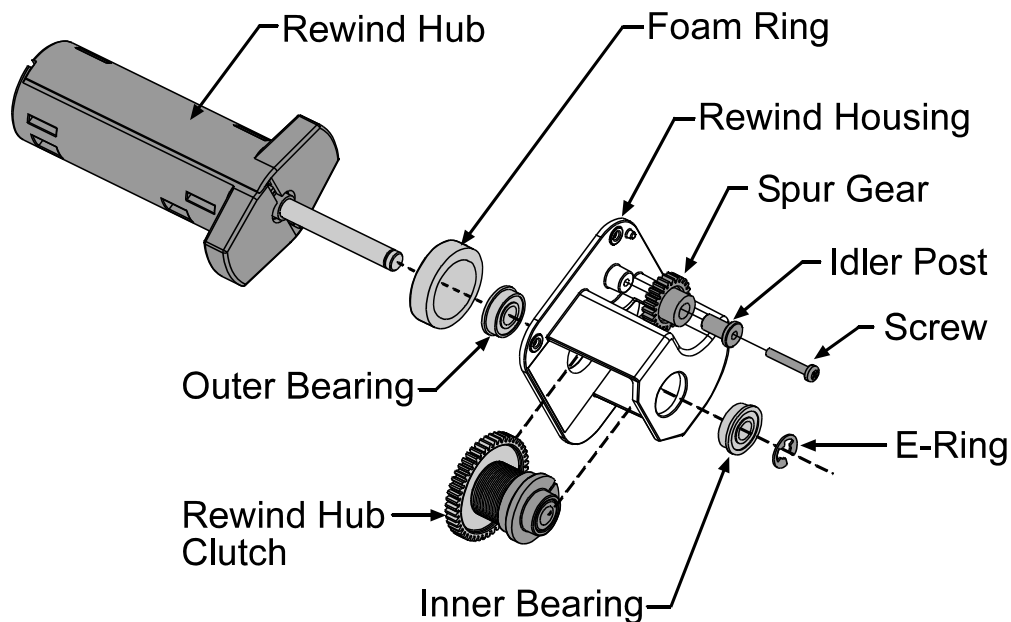

Replacement:

1. Reinstall the Rewind Assembly in the Centerplate, carefully engaging the gears, and secure it using the three Screws.

4.15.1 Rewind Hub, Clutch Assembly, and Spur Gear

Removal:

1. Remove the Rewind Assembly; see Section 4.15.

2. Remove the E-Ring from the Rewind Hub shaft and remove the Inner Bearing.

3. Remove the Rewind Hub and the Outer Bearing from the Rewind Housing.

4. Remove the Rewind Hub Clutch from the Housing (and to remove the Spur Gear, remove the Screw that secures the Idler Post to the Rewind Housing).

Replacement:

1. Reinstall the Outer Bearing in the Rewind Housing.

2. Position the Rewind Hub Clutch in the Rewind Housing.

3. Slide the Rewind Hub shaft through the Rewind Hub Clutch and Rewind Housing.

4. Reinstall the Inner Bearing and clip the E-Ring onto the Rewind Hub shaft (also, if removed, position the Spur Gear onto the Idler Post and secure the post the Rewind Housing with the Screw).

5. Reinstall the Rewind Assembly; see Section 4.15.